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Demands For Tonnage Mount

Specifications Received By Mills Against Recent Buying Are Heavy—Chicago's Volume Best of Year—Prices Show More Strength in All Lines—Railroad Buying Goes Forward—Steel Output Gains Further

GROWING demands for tonnages are being directed to the mills against the large volume of orders recently placed although the approach of the inventory season is causing some holding back in the stocking of material. No doubt now exists that consumption is expanding with definite progress and the trustworthy evidence of this is to be found in the multiplying number of assorted undertakings of a concrete character that are being brought into the market or are being committed. On the question whether speculation has entered heavily into the recent buying, producers point to the number of supplementary lots that are being placed by various individual users. This is construed to show that obligations, as a rule, have been incurred only as positive requirements have arisen.

Chicago mills have experienced the greatest week of the whole year in the tonnage passed for rolling. Much of this is for steel for buildings and railroad equipment. Free capacity for the first quarter in that territory now is limited. Other districts are beginning to experience increasing benefits from the filled-up condition of the Chicago mills. Large makers of sheets at Pittsburgh this week received specifications averaging 11,000 tons daily or at a rate 70 per cent in excess of capacity.

From Detroit comes the statement that the automobile industry is in the most liquid condition at this time of any similar date in five years. One builder has just placed an order for 8000 tons of steel.

Production is still on the rise. Chicago operations are at 83 per cent of ingot capacity this week and the same rate is shown in the Mahoning Valley. Large independent companies at Pittsburgh are running at 85 per cent. The Steel corporation is operating 75 per cent of ingot and 78 to 80 per cent of finishing activity.

Output Is Rising

Steel ingot production in November was the largest since April. It reached a point 77.5 per cent of the high mark in March which was the greatest single month in the history of the industry. It also revealed a recovery of 73 per cent from the low month of July. The gain of November over October was 7.8 per cent, putting the country on the operating basis of 38,650,000 tons annually. During the previous month the annual rate was 35,840,000 tons.

Market Is Stronger

Steel prices show a stronger tendency as the mills find themselves in a more comfortable position on bookings. Blue annealed sheets have firmed up at the equivalent of 2.70c, Pittsburgh. Some galvanized sheet mills have withdrawn from the market. Plates which have been weak are better held especially in the East. Sheet bar buyers have offered $37.50 though regular customers still can get limited tonnage at $37. Soil pipe is up $5.

Nut and bolt prices have been put on the basis of producer's plants to conform to the elimination of Pittsburgh base. A new schedule about 10 per cent higher has been issued but freight now is allowed on lots of 1000 pounds or more in a wide territory.

IRON TRADE REVIEW composite of fourteen leading iron and steel products again has sharply advanced. This week it stands at $39.94, compared with $39.58 last week and is at the highest point since early July.

A shortage of early pig iron has developed at Chicago and some melters have been obliged to curtail operations slightly because of it. All districts report good shipments with modest selling. Steelmakers are showing more interest in basic as their operations grow. Prices are working higher.

New vessels have contributed considerable tonnage to the market. For the Matson Line steamship just awarded the Carnegie Steel Co. will furnish 8500 tons. A Pittsburgh independent has taken 5000 tons for another ore lake carrier just placed.

Buying Keeps Heavy

The railroads are keeping up their heavy buying. Five lines placed 4000 cars and three others came out for 6000 more this week. Total car awards in November were 12,720. About 125,000 tons of rails and 20,000 tons of track fastenings are on the verge of closing for the Chicago Northwestern, Rock Island, Soo Line and Pere Marquette. The Pennsylvania's order for 100,000 to 150,000 tons probably will not be placed until January.

With more than 150,000 tons of structural steel work awarded in the two weeks previously, bookings of the past week have been less important totaling 29,968 tons.

Business Trend and Chart Section Page 1561

The Reader's Page

Contents, Dec. 11, 1924

ENGINEERING ARTICLES

New Demands for Reinforcing Steel—By L. N. Duryea.....1565

Estimating Iron Ore Resources.....1568

Training the Foundry Apprentice—By R. A. Peebles.....1570

Controls Manufacturing Methods—By Ralph E. Flanders.....1573

Large Uses of Steel in Small Ways—Pocket Knives.....1579

MARKET AND GENERAL NEWS

General Market Review.....1537

Domestic Market Reports.....1539-1551

Price Tables.....1540, 1541, 1598, 1600, 1602, 1604

Editorials.....1556-1557

Business Trend Charts.....1561-1564

A. S. M. E. Discusses Problems.....1581

Show Visualizes Scope of Power.....1584

French Foundrymen Meet in Paris.....1586

Offers New Idea in Management.....1588

Yesterdays in Industry..1558

Obituary.....1589

Here and There in Industry.....1590

Men of Industry.....1591

Machinery Market Report.....1593

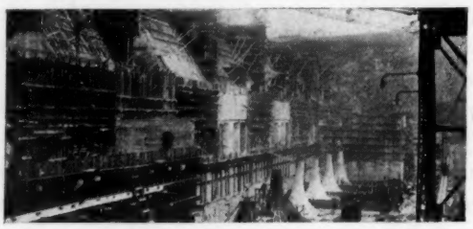
Crane Awards and Inquiries.....1594

Business Changes.....1595

Construction and Enterprise.....1596, 1597

Watch for Yearbook of Industry

IRON TRADE REVIEW'S Yearbook of Industry, as the annual number has come to be commonly regarded, will be one of the largest, and one of the most valuable issues of its kind ever published. The Yearbook presents a panorama of industry, shows its progress and present state of development from the economic and scientific viewpoints,



New Demands in Reinforcing Steel. Page 1565

nationally and internationally. It will contain more than 120 pages of reading matter and tables of prices and production, over periods of many years, and more in detail with respect to the past year. These are of great benefit and are useful throughout the year for reference, comparison and study. Various features of industrial business will be given special attention in separate articles prepared by members of the editorial staff of Iron Trade Review. From an editorial and advertising perspective the Yearbook will be of an unusual degree of excellence. The big issue will be out Jan. 1. Watch for it!

Cross Sections of Industry

"95 per cent of iron and steel plants are equipped with overhead traveling cranes, averaging six 20-ton cranes to the plant."—*From IRON TRADE REVIEW'S Survey, "Cranes".*

Pig Iron Shipments Heavy—Scarcity Appears at Chicago—New Buying Moderate—Prices Moving Up

PITTSBURGH, Dec. 9.—While pig iron buying activity is on a lower scale than recently, prices are strong. In several directions they are 50 cents higher than a week ago, No. 2 foundry, malleable and basic now being quoted at $20.50 minimum, with $21 and $22 quoted on No. 2 foundry (1.75 to 2.25 silicon), as far as first quarter deliveries are concerned. In the prompt market, none of the latter grade is available at less than $20.50. Recent buyers include the Hockensmith Mine & Car Wheel Co., taking about 300 tons, and a foundry in the Jeannette, Pa. district taking about 600 tons. A valley interest continues to report its ability to secure $22 in the prompt and future market on No. 2 iron, several sales of limited tonnage being available. The majority of foundry iron users are under cover and those now closing are taking below 500 tons each. The Pressed Steel Car Co. is understood to have purchased several hundred tons of malleable from its regular source at prevailing market levels. The Fort Pitt Malleable Iron Co. now is in the market for 1000 to 2000 tons of malleable for first quarter delivery. The Allegheny Steel Co. and the General Electric Co., conducted another joint purchase of basic iron involving several thousand tons on a 10,000-ton inquiry issued late last week, the sale being arranged in New York with an eastern Pennsylvania steelmaker. Price details are not divulged. The Bethlehem Steel Corp. now is out of the market on all grades of iron until prices advance still further. The bessemer market now is quoted at $21.50 on the basis of sales involving 200, 300 and 500 tons each, closed within the past few days.

Buying for First Quarter

Boston, Dec. 9.—New England foundries anxious to cover at the present market levels have been buying more extensively. One furnace taking a $3.65 freight rate advanced twice during the week and the tendency among Buffalo and eastern Pennsylvania furnaces is to increase differentials from 50 cents to $1 for each 50 silicon points. Sales of the past week include a 2000-ton and two 1000-ton lots in addition to many orders for 500 tons and less, and the total booked by Boston dealers is close to 10,000 tons. Most Pennsylvania furnaces are firm at $23 base, or $26.65 delivered for first quarter. Buffalo furnaces are practically uniform at $22 for first quarter or $26.91 delivered. A sale of 500 tons of eastern Pennsylvania No. 2X (2.25 to 2.75 silicon) was entered at $23.50 furnace or $27.15 delivered. Buffalo iron in moderate tonnages has sold for prompt delivery at $23 furnace or $27.91 delivered. Demand for spot tonnages is urgent, and the expected foreign iron has not yet arrived to relieve this situation.

Less Foreign Iron Available

New York, Dec. 9.—Thatcher Furnace Co., Newark N. J., has closed on several thousand tons of foundry iron for the first quarter of 1925. This company previously had bought its regular first quarter requirements. The Central Foundry Co., which also previously had bought for the first quarter, continues to negotiate for some additional first quarter tonnage. Otherwise the developments of the past week in pig iron were not of great importance. The total tonnage was comparatively small. New inquiries are light. The market is firm, and in some cases eastern Pennsylvania foundry iron has sold for the first quarter as high as $23.50, base furnace, plus full $1 silicon differentials. The minimum on eastern Pennsylvania iron is $22.50 base with the tendency toward $1 differentials. Buffalo foundry has sold at $22, base furnace plus 50-cent silicon differentials, but in most cases $1 differentials also are observed on Buffalo iron. A feature is the decreased extent to which foreign iron is a factor. Less Indian iron is available for this country. Higher prices in Europe have resulted in making European iron less of a factor.

Shipments Unusually Good

Cleveland, Dec. 9.—While pig iron sales are diminishing, shipments are exceptionally good. One of the leading makers says its December shipments will show the best record of the last six months. Others report the movement to date is exceeding that of November; in one case by 50 per cent. All are gratified with the showing in a month usually below the average for shipments. The lull in the market is not so pronounced as customary at this season. Sales during the week by interests here totaled over 30,000 tons. Pending inquiries amount to 20,000 tons. One is for 5000 tons; another for 7000. More interest in the second quarter pig iron situation is noted; users want protection, where prices are withheld. Little of a definite character has been done for that period. Prices are strong. A Cleveland furnace has advanced 50 cents to $21.50, furnace, for local delivery. The other maker is out of the market. Lake furnaces west quote $21.50 to $22. Buffalo makers are firm at $22. One lot of 500 tons of No. 1 iron was sold at $23.50, Buffalo. A number of fair sales at $22 valley are reported by one merchant interest. The range on valley iron is $21 to $22. Some resale iron is being offered by one interest $20.50. A sale of one lot of 2000 tons of No. 2 foundry iron at $21.50, furnace, for delivery in the Cleveland 50-cent switching area is noted. Another lot of 3000 tons for local delivery was closed earlier in the week at $21, furnace. These tonnages are for the first quarter. The Westinghouse Electric & Mfg. Co. is reported to have closed for the needs of its Cleveland plant through the first half, the amount being over 6000 tons. Cleveland interests claim to have taken only part of this. An inquiry for 3000 tons of basic is pending. Requirements of some of the larger users of basic are being figured quietly. Some tonnage for first quarter recently was placed with associated interests. A local interest is quoting $21, furnace.

Inquiry Falling Off

Buffalo, Dec. 9.—Pig iron inquiry has dropped to a total of about 8000 tons, which includes one lot of 3000 tons of basic. Average base price for first quarter iron is $22.50. One maker reports having made sales within the week on a $23 base, with $1 differentials. One Buffalo furnace has nothing to sell for December delivery and is more than 80 per cent sold for first quarter. Another reports 75 per cent of its capacity for first quarter booked. Sales last week were small, with $23 as the base for December and $22 to $23 on first quarter.

Report Scarcity of Iron

Chicago, Dec. 9.—The chief worry of northern iron interests is in meeting demands of melters for expediting shipments. Some melters are forced to curtail operations slightly, owing to a shortage of iron. Others are sending their own engines to furnace yards to take a few carloads available. Stocks on furnace yards are so broken up that the supply is practically depleted. It

is reported valley iron has been shipped to outlying points in Chicago territory. Meanwhile buying proceeds at a good rate, though below the average of recent weeks. Practically all melters have anticipated January contract quotas. One melter this week bought for the third time since the buying movement began. The market is firm at $22, furnace, for northern malleable and No. 2 foundry, with silicon differentials $1. One producer continues out of the market for first quarter. The $22 level is strong. One seller is predicting $23 by the end of the year. Recent selling is in lots of 500 to 1000 tons. Low phosphorus inquiry is good, with one for 500 tons and another for 1000 tons. Charcoal iron is strong, but unchanged at $26, furnace. The minimum on Birmingham iron is $20.

Basic Inquiries Heavy

Philadelphia, Dec. 9.—Heavy inquiry for basic iron features the market. At least three eastern consumers want a round tonnage. These inquiries are surprising as previously it was thought first quarter iron was well covered. Basic is higher and it is doubted whether $22, furnace, now could be shaded. Sales of low phosphorus iron in the past week aggregated at least 3000 tons at unchanged prices. Foundry iron business is smaller than in recent weeks. Prices are strong. It is unlikely $23, base furnace, now could be shaded, while most makers are asking $23.50 base, and have made sales at the latter price. Silicon differentials mostly are $1 although 75 cents frequently is accepted. It is understood considerable tonnage of pipe iron has been closed. Virginia makers have advanced their price and it is now $24.50, base, plus 50 cents for No. 2X, plus $1 for No. 1X.

Southern Ohio Market Firm

Cincinnati, Dec. 9.—Pig iron activity has simmered down to sales of a few small lots, and occasionally 500 to 1000 tons. A Toledo melter closed for 1000 tons of malleable iron on a basis of $22, Ironton. Sales the past week did not exceed 5000 tons and at least half of the tonnage was for shipment outside of the district. New inquiry is quiet. Prices are firm. The southern Ohio market is quoted at $22, Ironton, while southern iron now is firmly established at $20, Birmingham. The furnace interest that was quoting $19.50 furnace brought its price up with the other producers today. The Hatfield-Penfield Co., Bucyrus, O., is reported to have bought 600 tons of low phosphorus iron, while the Wickham Piano Plate Co., Springfield, closed for 500 tons of northern iron for first quarter. Other sales include 200 tons of southern iron to Advance Stove Works, Evansville, Ind.; 800 tons of the same grade to a melter at Toledo, O., and 300 tons of northern iron to a user at Indianapolis. Furnaces report heavy shipments.

St. Louis Market Strong

St. Louis, Dec. 8.—Fair purchasing of pig iron continues, but the volume is much lighter than two or three weeks ago. A number of melters have filled their requirements, and others are deferring buying until after inventory. The melt is steadily increasing. In a number of instances requests have been made to expedite deliveries, and for anticipation of quotas not yet due. Prices on all grades are strong. Producers are not pressing to sell. Sellers feel confident users of basis iron come into the market soon. Much more foundry iron is to be purchased for first quarter, particularly by the smaller users. Since the first of the month some excellent orders have been booked by mills and foundries. A substantial portion of the iron and steel for equipment recently placed by western carriers has been awarded to manufacturers in this district. Plants specializing in gray castings report a better influx of new business than in more than a year. Similar accounts are given by specialty makers, notably the stove and implement producers. The National Enameling & Stamping Co. now has eight of its ten furnaces in operation, and additional furnaces have been lighted by other large interests.

Offerings of No. 2 southern iron at $19 virtually had disappeared and sales at $20 Birmingham have been reported dluring the past several days. The lowest on Chicago iron is $21.50, and the leading local producer is asking $23 to $23.50, f.o.b. Granite City. Sales reported this week total around

(*Continued on Page* 1545)

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Dec. 10, 1924	Nov., 1924	Sept., 1924	Dec., 1923
PIG IRON				
Bessemer valley del., Pitts....	$23.26	22.11	21.76	24.17
Basic, valley	20.50	19.25	19.00	20.50
Basic, eastern del., eastern Pa.	22.63	21.46	20.00	23.30
*No. 2 foundry, del. Pitts....	22.26	21.36	21.26	23.77
No. 2 foundry, Chicago	22.00	21.00	20.50	23.00
*Southern No. 2, Birmingham..	20.00	17.90	17.65	20.75
*Southern Ohio, No. 2, Ironton	22.00	20.90	20.00	22.50
**No. 2X, Virginia furnace....	25.00	24.50	24.50	24.50
**No. 2X, eastern, del. Phila....	24.88	22.98	21.26	24.26
Malleable, valley	20.50	19.75	19.50	21.50
Malleable, Chicago	22.00	21.00	20.50	23.00
Lake Superior charcoal, Chicago	29.04	29.04	29.04	29.04
Gray forge, val., del. Pittsburgh	21.76	20.76	20.76	23.27
Ferromanganese, del., Pitts....	109.79	107.29	97.79	113.79
SEMIFINISHED MATERIAL				
Sheet bars, bessemer, Pittsburgh	37.00	37.00	37.50	42.50
Sheet bars, open-hearth, Pitts....	37.00	37.00	37.50	42.50
Billets, bessemer, Pittsburgh	35.50	35.50	37.10	40.35
Billets, open-hearth, Pittsburgh.	35.50	35.50	37.10	40.35
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.10	2.05	2.05	2.40
Steel bars, Chicago	2.10	2.05	2.05	2.50
Steel bars, Philadelphia	2.32	2.295	2.37	2.72
Iron bars, Philadelphia	2.37	2.345	2.32	2.62
Iron bars, Chicago mill	2.00	2.10	2.15	2.40

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.

	Dec. 10, 1924	Nov., 1924	Sept. 1924	Dec., 1923
FINISHED MATERIAL (Continued)				
Beams, Pittsburgh	2.00	2.00	2.00	2.50
Beams, Philadelphia	2.32	2.12	2.22	2.72
Beams, Chicago	2.20	2.15	2.10	2.60
Tank plates, Pittsburgh	1.90	1.85	1.95	2.50
Tank plates, Philadelphia	2.22	2.02	1.97	2.72
Tank plates, Chicago	2.20	2.15	2.10	2.60
Sheets, blk., No. 28, Pittsburgh	3.50	3.45	3.45	3.75
Sheets, blue anl., No. 10, Pitts.	2.70	2.60	2.70	2.95
Sheets, galv., No. 28, Pittsburgh	4.60	4.60	4.60	4.90
Sheets, black, No. 28, Chicago..	3.75	3.65	3.75	4.10
Sheets, blue anl. No. 10, Chicago	2.90	2.85	2.95	3.35
Sheets, galv. No. 28, Chicago	4.90	4.75	4.85	5.20
Wire nails, Pittsburgh	2.85	2.75	2.80	3.00
Wire nails, Chicago	3.00	2.95	3.10	3.35
COKE				
Connellsville furnace, ovens	3.35	3.00	3.00	3.85
Connellsville foundry, ovens ...	4.25	4.05	4.00	4.80
OLD MATERIAL				
Heavy melting steel, Pittsburgh	21.00	19.85	18.60	18.35
Heavy melting steel, eastern Pa.	20.50	18.05	17.75	16.80
Heavy melting steel, Chicago....	18.25	17.05	16.40	16.00
No. 1 wrought, eastern Pa....	19.50	18.95	18.75	19.00
No. 1 wrought, Chicago.....	18.75	17.10	16.70	16.35
Rails for rolling, Chicago	19.50	18.20	17.40	17.05

Composite Market Average

Representing the Combined Average Prices Per Ton of Fourteen Leading Iron and Steel Products Yesterday, One Week, One Month, Three Months, One Year and Ten Years Ago.

Dec. 10, 1924	Dec. 3, 1924	Nov., 1924	September, 1924	Dec., 1923	Dec., 1914
$39.94	$39.58	$39.00	$39.05	$43.02	$21.58

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

Iron and Steel Prices

SCRAP PRICES, PAGE 1604; WAREHOUSE, PAGE 1600; ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 1598

Pig Iron

Prices per gross ton

Bessemer, valley	$21.50
Bessemer, Pittsburgh	23.26
Basic, valley	20.50 to 21.00
Basic, Pittsburgh	22.26 to 22.76
Basic, Buffalo	22.00 to 22.50
Basic del., eastern Pa.	22.50 to 23.00
Malleable, valley	20.50 to 21.00
Malleable, Pittsburgh	22.26 to 22.76
Malleable, Cleveland, del.	21.50
Malleable, Chicago	22.00
Malleable, Buffalo	22.00 to 22.50
Malleable, del., eastern Pa.	24.75 to 25.75

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eas'n and Virgina	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	25.63 to 26.26
No. 1X, Buffalo	23.00 to 24.00
No. 1 foundry, Chicago	23.00
No. 2 foundry, valley	20.50 to 22.00
No. 2 foundry, Pittsburgh	22.26 to 23.76
No. 2 foundry, Buffalo	22.00 to 23.00
No. 2 foundry, Chicago	22.00
No. 2 foundry, Granite City	23.00 to 23.50
No. 2 foundry, Ironton fur.	21.50 to 22.00
No. 2 foundry, Cleveland, del	21.50 to 22.00
No. 2 foundry, del., Phila.	24.13 to 24.26
No. 2 foundry, N. J., tidewater	24.39 to 25.14
No. 2X, eastern del., Phila.	24.88 to 25.26
No. 2X, east. N. J. tidewater	25.14 to 26.14
No. 2X, eastern del., Boston	26.65 to 27.65
No. 2X, foundry, Buffalo fur.	22.50 to 23.50
No. 2X, Buffalo, del., Boston.	27.41 to 27.91
No. 2 southern, Birmingham	20.00
No. 2 southern, Cincinnati	24.05
No. 2 southern, Philadelphia	27.80
No. 2 southern, Chicago	26.01
No. 2 southern, Cleveland	26.01
No. 2 southern Boston (rail and water)	26.91
No. 2 southern, St. Louis	24.17 to 25.17
No. 2X, Virginia furnace	25.00
No. 2X, Virginia, Phila	30.17
No. 2X, Virginia, Jersey City	30.54
No. 2+, Virginia, Boston	30.92
Gray forge, eastern Pa.	23.00 to 23.50
Gray forge, val. del., Pitts.	21.76 to 22.26
Low phos., standard, valley	29.00 to 29.50
Low phos., standard, Phila.	29.79
Low phos., Lebanon, furnace	25.00 to 25.50
Charcoal, Birmingham	30.00
Charcoal, Superior, Chicago	29.04

Silvery iron, Jackson county, Ohio, furnace, 7 to 8 per cent, $29.00; 8 to 9 per cent, $30.50; 9 to 10 per cent; $32.50; 10 to 11 per cent, $34.50; 11 to 12 per cent, $37.00; 12 per cent, $39.50.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 to 11 per cent, $39.50; 11 to 12 per cent, $42.00; 12 to 13 per cent, $44.50.

Ferroalloys

†Ferromanganese 78 to 82 per cent, tidewater, or furnace first hand and resale	$105.00
Ferromanganese delivered Pittsburgh	109.79
Spiegeleisen 19 to 21 per cent domestic furnace or tidewater	31.00 to 33.00
Ferrosilicon, 50 per cent contract freight allowed	82.50
Ferrotungsten standard, cents per pound contained	82.00 to 88.00
Ferrochrome, 60 to 70 chromium, 6 to 8 carbon, cents per pound contained, del.	11.00 to 11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.25 to 3.75
Ferro-carbon-titanium, car lots, producer's plant, net ton	200.00

†Duty paid.

Coke

Beehive, Ovens
Prices per net ton

Connellsville, furnace	3.35 to 4.00
Connellsville foundry	4.25 to 5.00
New river foundry	8.50 to 9.00
Wise county furnace	3.75 to 4.00
Wise county foundry	4.50 to 5.00
Alabama furnace	4.25 to 4.50
Alabama foundry	4.50 to 5.25

By-Product

Foundry, Newark, N. J., del.	$10.41
Foundry, Chicago, ovens	10.75
Foundry, New England del.	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	4.50 to 5.25

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS
4 x 4-inch and larger

Pittsburgh and Youngstown	$35.50 to 36.00
Philadelphia	41.80 to 42.80
Chicago	34.00 to 37.00
Forging, Pittsburgh	40.50 to 42.50
Forging, Philadelphia	46.80 to 47.80

SHEET BARS

Pittsburgh and Youngstown	37.00 to 37.50

SLABS

Pittsburgh	35.50 to 36.00
Youngstown	35.50

WIRE RODS
¼-inch and finer

Pittsburgh	$48.00
Cleveland	48.00
Chicago	49.00 to 51.00

Standard extras, $2.50 per ton over ¼-inch; $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp, Pittsburgh	1.90c to 2.00c
Universal skelp, Pittsburgh	1.90c to 2.00c
Sheared skelp, Pittsburgh	1.90c to 2.00c

Structural Shapes

Prices per pound

Pittsburgh	2.00c to 2.10c
Philadelphia	2.22c to 2.32c
New York	2.24c to 2.34c
Chicago	2.20c
Cleveland	2.19c to 2.29c
Birmingham	2.15c to 2.20c

Steel Plates

Pittsburgh	1.90c to 2.00c
Philadelphia	2.22c to 2.32c
New York	2.24c to 2.34c
Chicago	2.20c
Cleveland	2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.10c
Pittsburgh, cold finishing	2.25c
Pittsburgh, forging quality	2.35c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
Cleveland, soft steel	2.29c
Birmingham, soft steel	2.25c to 2.30c
San Francisco, soft steel	2.45c
Pittsburgh, refined iron	2.80c to 4.50c
Pittsburgh, reinforcing billet	2.10c
Chicago, rail steel	2.03c
Mill, rail steel	1.90c to 2.00c
Philadelphia, common iron	2.37c
New York, common iron	2.39c
Chicago, common iron	2.00c to 2.05c

Hoops, Bands, Strip

Prices per pound f.o.b. mills

Hoops, Pittsburgh, under 3 in.	2.40c to 2.50c
Hoops, Pittsburgh, 20 gage, under 1 in	2.75c to 3.75c
Bands, Pittsburgh	2.40c to 2.50c
Hot rolled strip steel, Pittsburgh stamping quality	2.40c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base, Pittsburgh, Cleveland.	4.15c

Chicago and Worcester, Mass. $3 per ton higher.

Cold Finished Steel

Prices per pound

Cold finished steel bars, drawn or rolled Pittsburgh, Chicago, carloads	2.80c
Less carloads	3.05c
Steel shafting, turned and polished Pittsburgh, Chicago	2.80c

Screw stock base Cleveland $1 higher; and Worcester $3 higher than Pittsburgh and Chicago.

Rails, Track Material

Standard bessemer rails, mill	$43 00
Standard open-hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 32.50
Relaying rails, Pittsburgh	27.00 to 30.00
Light rails, 25 to 45, mill	1.80c to 1.90c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c
Spikes, small railroad, 7/16-inch and smaller, Pittsburgh	3.10c
Spikes, boat and barge, Pitts.	3.25c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.75c to 4.00c
Track bolts, Chicago	3.90c
Tie plates, Pittsburgh	2.35c
Tie plates, Chicago	2.35c

Spike, tie plate and truck bolt prices for carlots.

Wire Products

To Jobbers in Carloads
Prices per pound

F.o.b. Cleveland and Pittsburgh base

Wire nails	2.85c
Galv'd nails, 1-inch and over	5.10c
Plain wire	2.60c
Annealed wire	2.75c
Galvanized wire No. 9 gage	3.20c
Barbed wire, painted	3.30c
Barbed wire galvanized	3.55c
Polished staples	3.30c
Galvanized staples	3.55c
Coated nails, count keg	2.25c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7 bars and 12-in. stays per 100 rods, f.o.b. Pittsburgh	$20.56

Joliet, DeKalb and Waukegan, Ill., $2 per ton over Cleveland-Pittsburgh base on products made there. Worcester, Mass., and Fairfield, Ala., $3 higher. Duluth $2 higher. Chicago delivered price $3 higher, Anderson, Ind., $1 higher.

Sheets

Prices per pound

SHEET MILL BLACK

No. 28, Pittsburgh base	3.50c to 3.60c
No. 28, Philadelphia, delivered	3.72c to 3.82c
No. 28, Gary, Indiana Harbor	3.70c
No. 28, Chicago, delivered	3.75c

TIN MILL, BLACK

No. 28, Pittsburgh base	3.40c to 3.60c
No. 28, Gary base	3.70c

GALVANIZED

No. 28, Pittsburgh, base	4.60c to 4.75c
No. 28, Philadelphia, delivered	4.92c to 5.07c
No. 28, Gary Indiana Harbor	4.85c
No. 28, Chicago, delivered	4.90c

BLUE ANNEALED

No. 10, Pittsburgh base	2.70c
No. 10, Philadelphia, delivered	3.02c
No. 10, Gary, Indiana Harbor	2.85c
No. 10, Chicago, delivered	2.90c

AUTOMOBILE SHEETS

No. 22, Pittsburgh, base	4.60c to 4.75c

Tin Plate

Prices per 100-pound box, Pittsburgh

Tin plate, coke base	$5.50

Gary, Ind. base 10 cents higher

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less and $4 per ton higher. Chicago delivered 2½ points less and $5 per ton higher.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—f.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled, 3½ to 3¾-inch.	35

Chain, Piling, Cut Nails

Prices per pound

Chain, 1-in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	1.95c to 2.05c
Cut nails, f.o.b. mills	2.90c

Hot Rolled Alloy Steels

Price per pound, Pittsburgh base

S. A. E. Series—	
2300 (3½ per cent nickel)	4.75c
3100 (nickel chromium)	3.65c to 3.75c
6100 (chrome vanadium)	4.50c to 4.75c
6100 (Chrome vanadium spring)	4.00c to 4.25c
9250 (Silico manganese spring)	3.15c to 3.50c

Billets—4 x 4 to 10 x 10, gross ton at net ton bar price; under 4 x 4 to 2½ x 2½-inch, $5 higher.

Chicago base $2 per ton above Pittsburgh.

Scrap Level Is Higher

Consistent Advance in Most Centers Shows Strength of Underlying Market—Consumers Resist but Each Sale Gives Higher Level

SCRAP PRICES, PAGE 1604

Chicago, Dec. 9.—The advance in iron and steel scrap may be measured by a sale of 10,000 tons of heavy melting steel to a local steelmaker at $18.50, delivered, and several sales of less than 1000 tons between dealers at $18.75. Whether dealers would sell another tonnage of steel at $18.50 is doubted. Dealers and brokers continue extremely bullish and see no barriers in the immediate future. All grades of scrap reflect the strength of steel but some consumers are unwilling to pay present prices. The Crane Co. is understood to be a prospective buyer of malleable but is taking issue with present prices. Cast grades have moved somewhat better. The market now is generally on the basis of $18.25 to $18.75 for heavy melting steel. Railroad offerings of scrap include 3800 tons by the Santa Fe and 800 tons by the George W. Jennings Co.

Boston Prices Advance

Boston, Dec. 9.—Steel mill scrap has advanced. Heavy melting steel has sold from $20 to $21 in the Pennsylvania market which means that dealers can pay about $15 shipping point. For local shipment prices are somewhat higher. Wrought pipe has been advanced to $13 and No. 1 railroad wrought to $16. Demand for mixed borings and turnings is less and prices are stationary or possibly a little soft. Steel car axles also have softened, the price at present being hardly above $20 delivered. Cast grades have all stiffened. No. 1 cast has been marked up to $20 from $19.50, and strictly textile scrap continues scarce with premiums as much as a dollar above No. 1 cast quoted in a few cases. Chemical borings are in strong demand and considerable interest attaches to the offer of a large accumulation by the Whitin Machine Works, Whitinsville, Mass. The General Electric Co. has just opened bids covering 28 carloads of miscellaneous scrap. The Boston & Albany railroad has sold 500 tons of steel scrap.

Sluggish at New York

New York, Dec. 9.—Dealers' buying prices are unchanged and trading has been rather sluggish, with little consuming demand and with less dealer interest. Some dealers look for little real activity until after the first of the year but prices are firm. On railroad steel or the equivalent, for shipment to Bethlehem, Pa., dealers are paying $18, delivered. Machinery cast is in little better demand, and stove plate is somewhat more active, but the aggregate tonnage involved is not large.

Stronger Market at Buffalo

Buffalo, Dec. 9.—Further strengthening of the scrap market has taken place within the past week. Prices have advanced 50 cents a ton on a number of materials and in some instances dealers have refused offers which included the advance. Heavy melting steel remains somewhat clouded with dealers insisting they have refused $19 for No. 1 material. A railroad tonnage closed here brought $20, it is reported. Opinion of dealers is that any melter would have to pay $20 to $20.50 for a real tonnage of No. 1 material. Other materials have been carried upward with steel. Machine shop turnings have been in fair demand and two Cleveland consumers have been in the market for borings. Dealers have paid $14.50 to $15 for material for this trade. Local steelworks continue to offer $14 to $14.50 for turnings and borings.

More Activity In East

Philadelphia, Dec. 9.—Two eastern mills have bought round tonnages of heavy melting steel at $21, which is the highest price reached in this movement, due to rapid developments. The market covers a wide spread from $19 to $21, while odd lots have been bought during the last few days at $18 delivered, Bethlehem. The tendency is strongly upward, with fair buying in scattered lots. The total is less than consumption and heavier buying is expected.

Foundries and Mills Buying

Pittsburgh, Dec. 9.—Practically every iron and steel foundry in the Pittsburgh district is inquiring for scrap and sales are frequent. Much of this activity has developed almost over night and apparently foundries at last are experiencing improved business conditions. Low phosphorus billet and bloom crops have sold recently at $25.50 to $26, an advance of $1.50, and low phosphorus punchings this week have brought $24 to $24.50, an increase of $2. Steel producers are showing more interest and sales recently made have reached several thousand tons at a time. Users at nearby points such as Weirton, Monessen, and Steubenville are scheduled as early buyers. The Pennsylvania railroad obtained around $22 for heavy melting steel on its recent list, with similarly high bids on other grades. Next sales of heavy melting steel undoubtedly will be $22 or higher; some dealers already are quoting a minimum of $22.50. On the basis of last sales heavy melting steel is quoted at $21 to $21.50. As high as $18 has been obtained for machine shop turnings, an advance of $1 and on railroad malleable at least one or two sales are noted at $21. Rails for rolling and cast iron borings are up 50 cents, while steel specialties are up $1 on the basis of sales within the past week.

Cincinnati Market Strong

Cincinnati, Dec. 9.—Strength continues in the iron and steel scrap market. This is under the influence of increased consumer inquiry and buying, considerable tonnage in nearby territory having been placed. Desultory buying characterizes the market here with dealers furnishing most of the activity. They are buying for stock and at the prices they are now paying will have to obtain

(*Concluded on Page* 1550)

Semifinished Is Stronger

Makers Booked Heavily Asking Higher Prices—$38 Valley Quoted on Sheet Bars—Some Needs Still To Be Covered

SEMIFINISHED STEEL PRICES, PAGE 1541

Youngstown, O., Dec. 9.—Semifinished producers have been busy during the past two weeks arranging contracts for first quarter sheet bars and from all indications tonnages of this commodity will be scarce. Contracts were made on the basis of $37, Youngstown. Whether this price now can be duplicated is a matter of conjecture. One mill has all the tonnage it needs but if more material becomes available $38.50, Youngstown, will be named. Another producer has closed with customers on the $37 basis but has withdrawn this figure from open market quotation. No inquiry for billets or slabs is before producers. Prices are unchanged at $35.50 Youngstown.

Wire Rods Stronger

New York, Dec. 9.—The $45 base Pittsburgh price on wire rods now has nearly disappeared. The current market is $46 to $47, with sales at both figures.

Billet Prices Unchanged

Philadelphia, Dec. 9.—Billet sales are small, at unchanged prices; $36 to $37, base Pittsburgh, for rerolling and $41 to $42 for forging. Wire rods are $46 to $47.

Demand Improved

Buffalo, Dec. 9.—Demand for semifinished material shows improvement. Operation of the district as a whole has been increased to 70 to 75 per cent of capacity.

Buyers Are Covered

Pittsburgh, Dec. 9.—Semifinished inquiries are practically absent, as many buyers have covered on their requirements for the first quarter. One buyer of sheet bars was endeavoring to place 3000 tons late last week, and offered to pay a Pennsylvania producer $37.50. The offer was refused. That figure is being quoted regular customers however. Producers in the Youngstown district recently booked a large quantity of sheet bar business for regular customers for first quarter at $37. Billets are unchanged at $35.50, with forging billets bringing the regular $5 differential, making the price $40.50. Several buyers of forging billets remain uncovered as far as first quarter is concerned and these contracts probably will be written within a few days. Users of rerolling billets are well protected. Wire rods are quoted at $48 although most consumers are protected at lower figures and specifications against $45 and $46 contracts are being liberally furnished. Skelp is unchanged at 1.90c to 2.00c, with some producers manifesting a keen desire to obtain higher figures. No inquiries now are out.

Buyers Still Seeking Tonnage

Cleveland, Dec. 9.—Some buyers of

sheet bars, billets and slabs still are in the market for fair size tonnages, despite heavy contracting reported recently in the principal producing centers. A number of inquiries have been turned away by the leading maker in this territory during the week. It closed with one or two additional customers for the first quarter, and now is out of the market, all its capacity being engaged. Prices quoted by trade papers at time of delivery govern these sales. While valley makers are reported to have closed contracts with regular customers for sheet bars at $37, mills now are understood to be making a price of $38 on new business.

First Quarter Prices Named

Cincinnati, Dec. 9.—Books of the Andrews Steel Co., Newport, Ky., have been opened for first quarter business at the following prices, f.o.b. Newport: Rerolling billets, $39 gross tons, sheet bars, $40 and forging billets $43.50.

Tin Plate Active

Specifications for January Heavy—Large Consumers Are Purchasing

TIN PLATE PRICES, PAGE 1541

Pittsburgh, Dec. 9.—Overdue specifications for January tin plate requirements of can makers are growing, in many cases before the actual contracts have been signed. This permits the mills to roll the material now for shipment subsequent to Jan. 1. One producer reports the receipt last week of specifications for 725,000 base boxes, about two-thirds of which is for packers' cans, and one order for 110,000 boxes of oil can sizes was included. Additional heavy specifications are coming through this week. First quarter requirements will be extensive. An additional order for about 60,000 base boxes has come to the American Sheet & Tin Plate Co. here for shipment to Italy at a comparatively high price. Some export prices have reached levels recently in excess of those charged by some of the independent producers to their preferential customers. The Standard Oil Co. of New York has distributed 140,000 base boxes for re-export purposes to independents, including the McKeesport Tin Plate Co. and the Bethlehem Steel Corp., at a comparatively low figure. The open market figure for prompt and future delivery is $5.50 per base box of 100 pounds, f.o.b. Pittsburgh mills.

Large Users Place Orders

New York, Dec. 9.—Heavy buying has featured the tin plate market here lately. The American Can Co., the Continental Can Co. and other important consumers have placed their requirements over the first half. In fact, the eastern trade generally now is covered for this period. While the market on small tonnages continues $5.50 per base box, Pittsburgh, the large consumers are understood to have closed for their requirements around $5.25, Pittsburgh.

Implement Prices Cut

The International Harvester Co., Chicago, has reduced prices on most of its lines from 5 to 6 per cent, or from $2 to $20 per implement, as a means of stimulating business.

Coke Users Paying More

First Quarter Contracts Closed at $3.75—One Sale at $4—Spot Minimum Is $3.50—Foundry Demand More Active

COKE PRICES, PAGE 1541

Pittsburgh, Dec. 9.—While some coke producers are somewhat inclined to quote levels higher than $4, others are disposed to hold the market in check somewhat, foreseeing possible interference from by-product quarters. It is reported that at least one consumer paid the $4 price but no details are available. Two or three paid $3.75 for first quarter requirements and one or two quotations at that level now are outstanding. One or two makers still are accepting business for future delivery at $3.50, although they are not willing to take it as far ahead as three months at that price. All are insisting upon the incorporation of the wage clause in contracts closed. One or two eastern stacks are in the market and the Jones & Laughlin Steel Corp., active among the steel companies recently purchasing beehive coke, is scheduled to buy more to augment its own by-product fuel supply for increased blast furnace operation. In the spot market, $3.35 appears to be absolute minimum, with $3.50 the more general quotation and selling price. Heating coke demand is light with small lots being closed at $3. No large inquiries now are out although some are expected to appear before many weeks from smelters and refineries. A large number of these interests are covered until April 1.

Foundry coke contracting activity is forging to the front after a dull period. Producers are talking of higher levels. Customers of coke oven operators making the medium price brands are negotiating, and it is possible that instead of $5, $5.25 soon will be quoted. Other foundry coke is available at $4.25 to $4.75, with premium brands bringing as high as $6 in box cars. Production of coke in the Connellsville region for the week ended Nov. 29 was 103,880 tons, as compared with 99,040 tons the preceding weeks, according to the *Connellsville Courier*.

Eastern Market Stronger

New York, Dec. 9.—While $4.50, Connellsville, has not disappeared on spot beehive foundry coke, the market is stronger and it now is more difficult to get good coke under $5. Some more contracting for first half of next year has been done at $5 to $5.25, Connellsville, but most producers ask fully 50 cents above this range. The price of by-product foundry coke continues $10.41 delivered at Newark and other Northern New Jersey consuming points and there is no intention of any change this month.

Market Activity Increasing

Cincinnati, Dec. 9.—Increased activity is noted in the local coke market, although large individual sales are few. Foundry coke is the bright spot and sales in the past week were larger in the aggregate than for several weeks past. There is a slight stiffening in prices. The bulk of the foundry coke sales specify first quarter shipment. The relighting of additional blast furnaces has stimulated demand for furnace coke. Features in recent foundry coke sales were the New River and Wise county grades. Connellsville coke is offering more competition in this market than in several months. By-product coke also is displaying greater activity and while producers have entered considerable business on their books for first quarter and first half, they are eager for additional tonnages. The market on New River foundry coke ranges from $8.50 to $9 ovens while the Wise county grade is quoted at $4.50 to $5, ovens.

Coke Demand Increases

St. Louis, Dec. 8.—Activities at mills and foundries is reflected in an increased demand for coke. Ordering is on a more extensive scale than heretofore, and during the past two weeks a disposition to stock up against winter requirements was noted. Ordering from the West has been on a larger scale, and good tonnages have moved to Iowa, Nebraska and Kansas. Virtually all needs are being taken care of by the by-product interests. Prices are unchanged on all grades.

Southern Market More Active

Birmingham, Ala., Dec. 8.—While quotations have not advanced, coke demand has improved considerably. Shipments are on a larger scale than for some time. By-product and beehive foundry coke is bringing $5 and $5.25 per ton, with the range at $4.50 to $5.25. A number of beehive ovens are resuming operations. The Alabama By-Products Corp., now expects to operate its additional 25 by-product ovens March, instead of April 15 as originally intended.

Pittsburgh Increases Rate

Pittsburgh, Dec. 9.—Increased operations are noted in connection with steelmaking, the general average being near 80 per cent. Some Mahoning valley producers are on that or a slightly higher basis. The Carnegie Steel Co. reached 76 per cent last week and expects to exceed that figure this present week. It has put on a blast furnace at Clairton, making 36 stacks active out of 59, and two more are scheduled to go on at Edgar Thomson, one today and one later as coke supplies are accumulated.

Will Add Blast Furnace

Equipment contracts covering the construction of a 600-ton blast furnace now are being let by the Central Steel Co., Massillon, O. The Riter-Conley Co., Pittsburgh, has been awarded the plate construction work involved in the erection of the stack, stoves, etc. Approximately 2000 tons will be involved. J. E. Moss Iron Works, Wheeling, W. Va., will fabricate the structural material included in the ore bins, trestle, skip incline, etc. The stack will be built under the direction of Freyn, Brassert & Co., Chicago.

Bar Tonnage Is Heavy

Largest Specifications in Year Sent to Chicago Mills—Quotations Below 2.10c Have Disappeared—Cold Finished More Active

BAR PRICES, PAGE 1541

Chicago, Dec. 9.—Chicago district makers of soft steel bars last week sent to mills the heaviest specifications in a year. New business was up to the average of the past month. The railroads, with more freight cars to be placed for 1925 delivery than have yet come out, are the biggest single market factor. In proportion to the steel it has taken in the past two years, the implement industry is recording the biggest gain. With both leading makers here order books account for a large proportion of first quarter capacity. One interest points out that the strength of the market makes an advance over 2.10c, Chicago, possible but that with little first quarter tonnage to sell prices are likely to hold over until a sharp advance for the second quarter.

Fence post manufacturers are placing considerable rail steel business. Implement and bed manufacturers also are good buyers. Rail steel mills generally have good backlogs. The delivered Chicago price continues 2.03c.

Bar iron bookings are only fair, but are improving. The quotation is unchanged at 2.00c to 2.05c, Chicago.

Boston Bar Prices Hold Well

Boston, Dec. 9.—Steel bars at Boston are firm at 2.465c delivered, corresponding to 2.10c, Pittsburgh, despite some softening in other districts. Specifications during the past week have shown a 25 per cent improvement over the week previous. Most consumers are now well covered by contract for first quarter requirements.

2.10c Is Ruling Figure

Pittsburgh, Dec. 9.—Open market figures below 2.10c on merchant steel bars have disappeared and some orders for 100 to 150 tons or more at a time were taken last week under highly competitive conditions at that price. Shipments on 2.00c contracts are heavy and specifications are liberal, furnished by manufacturers in various lines, including cold bar finishers, railroad car shops and others, with a fair sprinkling of orders from jobbers.

A decided improvement has come in connection with refined iron bars, and now 2.90c to 3.00c is a more representative spread of the market on ordinary refined iron bars than 2.80c to 2.90c. As high as 4.50c is quoted on bars of special refinement.

Speculation Is Not Apparent

Cleveland, Dec. 9.—Signs are present in the market that speculation has been minimized in the recent active buying by consumers of steel for delivery during the next 30 to 60 days. Some users who had already bought recently again came into the market the past week for considerable tonnages, indicating that their probable future requirements are on the increase. Notable in this business was the placing of an order for 8000 tons of bar products for delivery within the next 30 days or so by an automobile builder. Another buyer satisfied an additional need for 1000 tons. The effect of the approaching inventory season is to cause some holding back in specifications to be filled during the next few weeks but there continues a liberal ordering forward of tonnage, dating from Jan. 1 or shortly before. Steel bar prices are steady at 2.29c, Cleveland, equivalent to 2.10c, Pittsburgh. Bands are perceptibly stronger at 2.50c, Pittsburgh. Hoops now are quoted at 2.60c, Pittsburgh.

Buying Activity Greater

Pittsburgh, Dec. 9.—Activity in cold-finished steel bars is more extensive, specifications being received daily for fairly large tonnages. Most of these are for prompt delivery but it is expected that as soon as inventories are completed specifications will become more numerous. Various consuming lines have been buying and December operations of 60 to 70 per cent will show an increase of 20 to 30 per cent over the November average. Contracts in fairly large numbers have been written for first quarter during the past 10 days and the outlook is bright. While some makers protected the 2.70c price longer than others, 2.80c is now the open market quotation.

Auto Makers Buy Hoops

HOOP PRICES, PAGE 1541

Pittsburgh, Dec. 9.—Hoop and band orders are more numerous since many automotive interests which were staying out of the market have come in for tonnage. A fairly large number of contracts have been written for first quarter at 2.40c to 2.50c and some mills now have established an absolute minimum of 2.50c on material 3 inches and narrower. On the 1-inch hoops and bands, 2.75c to 3.75c is being quated. Operations are around 75 to 80 per cent of capacity.

Nuts and Bolts Advanced; Rivets Are Firm

NUT AND BOLT PRICES, PAGE 1598

Pittsburgh, Dec. 9.—Late last week books of nut and bolt manufacturers were opened for first quarter of 1925 with an advance of about 10 per cent the new figure on large machine bolts being 50 10 and 10 off. But since makers are naming the new prices delivered to destinations in certain prescribed territory instead of f.o.b. Pittsburgh district plants, the raise means little increased revenue. The new prices are being quoted delivered on shipments of 1000 pounds or more in territory bounded by a line drawn from Milwaukee, Wis., to Dubuque, Ia. all cities on or east of the Mississippi river to Cairo, Ill., all cities on or east of the Ohio river to Ironton, O., and all cities on or north of the main line of the Norfolk & Western railroad from Ironton, O. to Norfolk, Va. The upper pennisula of Michigan is expected from this territory. On Pacific, Atlantic and Gulf coast shipment by water, the quotaions are f.a.s. New York, Philadelphia or Baltimore. During the season of lake navigation, the freight is allowed; freight to Duluth, St. Paul and Minneapolis is allowed, but on shipments beyond the zone, freight is to be allowed only to the natural gateway where shipments cross the zone line.

The rivet price up to late yesterday was 2.60c, f.o.b. Pittsburgh district plants, but before the week is out this may be advanced by at least $3 per ton.

Rivets Are Firm

New York, Dec. 8.—The rivet market continues firm here and 2.60c base Pittsburgh represents the minimum figure to important buyers.

Quoting Delivered Price

Cleveland, Dec. 9.—Discounts have been lowered on bolts and nuts about 10 per cent for prompt and first quarter delivery. The increase in prices, however, amounts to only about 5 per cent, it is estimated, because producers have definitely abandoned quoting on a Pittsburgh and Chicago base, and now are naming f.o.b. their plants with freight allowed on all business of 1000 pounds and over to all points east of the Mississippi river, north of the Ohio river and north of the Norfolk & Western railroad, as well as to all natural gateways, such as St. Louis to the Southwest. A good volume of business is being entertained and better is looked for after Jan. 1.

Rivet makers continue to withhold prices for first quarter. Indications, however, are that prices will be about $3 a ton higher. The leading maker here reports it is receiving a good volume of orders from the structural interests and states its business this week has been the best in months.

Prices up 10 Per Cent

Chicago, Dec. 9.—First quarter quotations on bolts and nuts embrace an advance of about 10 per cent but it is stated that this rise does little more than absorb the increase in the freight allowance on orders of 1000 pounds or more. Typical of the advances is that in large machine bolts from 60 and 10 off for the last quarter to 50, 10 and 10 off for the first quarter.

As yet no business has been placed on this basis but makers expect little difficulty in view of the general advances in steel and the fact that they are meeting increased freight. Prices are based at the mill for quantities less than 1000 pounds. Business has been quiet, which is the usual circumstance at a time of change.

Ore Imports Heavier

Philadelphia, Dec. 9.—Imports here during the week ended Dec. 6. included 6988 tons of iron ore from Sweden, 572 tons from Germany and 6000 tons from Algeria, 2200 tons of chrome ore from Portuguese Africa, 544 tons of ferromanganese from England, 2758 tons of pig iron from Calcutta, 11 tons of steel plates from Belgium, 16 tons of scrap steel from England and 40 tons of scrap brass from Canada.

The Inland Steel Co. stack now

being relined probably will be making iron again Jan. 1, work having been greatly expedited by favorable weather.

Strong Wire Demand

Makers Find Consumers Need All Classes of Products—Mixed Orders

WIRE PRICES, PAGE 1541

Pittsburgh, Dec. 9.—Mixed orders for wire products are fairly numerous, interest among jobbers being high. These orders usually call for fencing, wire and staples, and are an anticipation of good business early in the new year. Nail orders occasionally are taken in straight carloads although mixed carloads are more frequent. Specifications against contracts are materializing at a fair rate since the current market prices are somewhat above the majority of the contract prices. The open market on plain wire is 2.60c and on wire nails 2.85c. Occasional concessions are noted in connection with cement-coated nails but the open market figure is unchanged at 2.25c.

Price Advance Rumored

Chicago, Dec. 9.—Western consumers of wire and nails have heard that quotations are to be advanced $2 a ton shortly but local sellers say no advance has been under consideration. Larger consumers covered fully for 60 days just before the $2 advance of three weeks ago. Current business is said to be firmly established upon the present basis of 2.70c, base Joliet and Waukegan, for wire and 2.95c for nails. Demand for all lines has been growing steadily and mill operations are now probably the heaviest of the year.

Prices Firm in East

New York, Dec. 9.—While old prices have not entirely disappeared, leading producers of wire and wire products now are firm at 2.60c, base Pittsburgh, for plain wire and 2.85c for nails. Much business was booked at the old prices, and demands have been pretty well cared for. Current buying is much smaller than a few weeks ago. The New York Central railroad has put out an inquiry for 350 tons of wire nails for first quarter.

Boston Sales Improve

Boston, Dec. 9.—Consumers of wire and wire products have been hurrying to cover at the old levels which several leading producers have held open through the past week. As a result tonnages placed have shown a marked increase. Orders for nails have totaled from 30,000 to 40,000 kegs. Plain wire has been quoted in Boston at 2.65c Worcester which is 15 cents below the new prices.

Strong Demand at Buffalo

Buffalo, Dec. 9.—Wire demand has reached the largest proportions of several months. The Wickwire Spencer Steel Corp., is operating its open hearth, blooming and rod mill departments at capacity. Present wire mill operation is in excess of 75 per cent and may be increased. There has been a good demand for wire cloth and netting. Keen price competition has developed in some centers due to new price policies. Buffalo mills are stocking welded fabric although present demand is small.

Plate Prices Are Firmer

Tonnages Placed With Mills Moderate—Lake and Ocean Vessel Awards Provide More Business—Eastern Operations Improve

PLATE PRICES, PAGE 1541

Cleveland, Dec. 9.—Lake shipbuilding again has contributed important tonnages of the week in plates. The Jones & Laughlin Steel Corp. will supply 5000 tons for a 600-foot ore freighter placed the past week with the Great Lakes Engineering Works, Detroit, by the Cleveland-Cliffs Steamship Co. The boat will have a capacity of 13,000 tons. Oglebay-Norton & Co., Cleveland, continue in the market for another modern ore carrier. Local mills will supply most of the 900 tons of steel for the repairs of the steamship W. G. MATHER.

Other than the vessel tonnage, the plate market has been made up mainly of small or moderate tonnages but the situation is showing more firmness. Some eastern mills now are withdrawing from the market and are quoting only on specific business put up to them. Some of the Pittsburgh mills are in a much more comfortable position for the next several months and are less anxious to bid for business. On one lot of several hundred tons this week as high as 2.10c was quoted. The general plate market remains within a range of 1.90c to 2.00c, Pittsburgh, or 2.09c to 2.19c, Cleveland.

Higher Than Pittsburgh Mills

New York, Dec. 9.—For the first time since the last bulge in business, eastern mills are asking higher prices on plates than the Pittsburgh mills. Three of the eastern makers now are quoting 1.95c base Pittsburgh on carloads and 2.00c base Pittsburgh on less than carloads. Carloads can be placed with the Pittsburgh makers at 1.90c base Pittsburgh. The 1.95c price represents an advance of $3 a ton from a week ago. Some protections at lower prices are out.

Eastern Operations Increased

Philadelphia, Dec. 9.—Plate mill operations have improved. Eastern makers are running 50 to 60 per cent. Prices are materially stronger. While some protection still is out, 1.90c appears minimum. On new business the market ranges from 1.90c to 2.00c, Pittsburgh. The Cramp yards has booked a steamer for the Matson Line. It is expected 8500 tons of steel required for the boat, will be awarded the Carnegie Steel Co. New inquiries include five barges for the Erie canal, requiring a total of 600 tons of steel. The Pennsylvania railroad has not taken action on its recent plate inquiry.

Price Trend Is Upward

Pittsburgh, Dec. 9.—The trend toward higher levels is becoming better defined in connection with steel plates and while 1.90c has not entirely disappeared, a few sales are noted at 1.95c and 2.00c. Some producers claim to be quoting 2.05c but no sales are confirmed at that level. The Riter-Conley Co., received the contract for plate work on the blast furnace of the Central Tube Co., Massillon, O., about 2000 tons. The Youngstown Boiler & Tank Co., recently received an award of fourteen 55,000-barrel tanks for Texas installation from an unidentified buyer involving about 2500 tons of plates, which probably will be rolled in the valley. The Pittsburgh-Des Moines Steel Co., has received further contracts for scattered water tanks and local fabricators expect a share in some of the oil tank work that is coming out.

Tank Tonnage Is Large

Chicago, Dec. 9.—It develops that fabricators of tanks have been taking good business recently and have been better buyers of plates than in several months. The leading independent has taken 5200 tons of plates for various tank fabricators. A riveted pipe line for the city of Denver requiring 2000 tons of plates has been placed. Freight car builders have been heavy buyers also but one interest is predicting a decided shortage in the first quarter when car business that is now prospective has been placed. The plate price is 2.20c, Chicago.

Pig Iron Shipments Heavy

(*Concluded from Page* 1540)

8000 tons, all of which except 1000 tons of basic for an Illinois steelmaker consisted of foundry grades for December and first quarter. A stovemaker purchased 600 tons, and 500 tons went to an East Side jobbing foundry.

More Iron Being Consumed

Birmingham, Ala., Dec. 8.—The southern pig iron market has slowed down, but remains strong the general quotation on No. 2 foundry iron now is $20. Two furnace companies are out of the market temporarily. A few sales of iron have been closed for the first half of year. Louisville buyers have much iiron due them from Birmingham producers. St. Louis and Chicago consumers also have purchased liberally in this territory. Two blast furnaces are preparing for operation on the turn of the year. Two furnace companies are out of the market temporarily. Local consumers are asking for steady delivery and melt is large. The holidays this year will be made as short as possible. The American Cast Iron Pipe Co., will give employes a week off. Other plants will close down two days in each of the two holiday weeks. Soil pipe shops will be idle a few days and foundries will lose little time.

Start Two More Stacks

Chicago, Dec. 9.—Two more blast furnace stacks have been blown in and the three leading steel makers in this district, with a total of 34 stacks, now have 24 active. Ingot operations have improved several points and the average for the district is about 83 per cent.

Concrete Market Dulls

Slipping Off of Number of Awards Noticed Although Demand Good for Season—Boston Warehouse Project Takes 1200 Tons

REINFORCING BAR PRICES, PAGE 1541

Chicago, Dec. 9.—The larger reinforcing bar jobs in this district having been placed before the recent price advances, sellers have only small projects ahead of them and none too many of these. General contractors are looking actively for work for the first time in some months. The situation is considered a normal, seasonal one. Considerable road work continues to be placed by the middle western states, especially Illinois. St. Paul will have a minimum of 1700 tons of bars to award in the next few days for a sewer. A 600-ton job has developed at Springfield, Ill., for the waterworks department. Revised plans are out for the Kinzie building, Chicago, involving about 200 tons. Reinforcing bar warehouses have been liberal buyers of bars for stock purposes recently. The reinforcing bar market is quoted at 2.60c, Chicago warehouse.

New Work Encouraging

Boston, Dec. 9.—New work is developing along encouraging lines and while the season is against placing of prompt tonnage, contracts already placed for first quarter are unusually heavy. The Statler hotel project again is active. This calls for 500 tons of bars and 400 tons of mesh. Recent awards include 1200 tons for the Harvard Trust Co. building, Boston, let to the Concrete Steel Co. and 400 tons for the Dorchester tunnel, Boston, let to an independent fabricator. The price range is 2.05c to 2.10c corresponding to 2.415c to 2.465c, Pittsburgh.

New Inquiry Is Small

Buffalo, N. Y., Dec. 9.—New inquiry for reinforcing bars is small. About 200 tons will be required for a Buffalo school on which bids are to be taken soon. Delivery of 200 tons for the Liberty bank superstructure will be begun this week. Mill price is 2.10c to 2.20c and on stock bars 2.30c to 2.65c is quoted. There is little new road work to be placed within the next three months and demand from this source will be small.

Inquiries Slack; Awards Nil

Pittsburgh, Dec. 9.—No inquiries are coming out for concrete reinforcing bars in large tonnages and only a few are current involving more than 50 tons apiece. No awards are being made outside of a few small tonnages. The price is unchanged at 2.10c, with 2.25c to 2.40c being obtained on warehouse stocks.

Market Quietest in Weeks

Cleveland, Dec. 9.—Less than 500 tons was booked by the leading concrete reinforcing bar interests in this district during the past week. The market was the quietest in a long time, with several dealers reporting less than 50 tons as the week's sales. Large projects still are drifting along and no action is expected until after Jan. 1 on jobs supposed to be active. On new steel bars 2.29c, Cleveland or 2.10c Pittsburgh is common, but a large and attractive tonnage, if there were any current, no doubt could break under 2.00c, Pittsburgh. Rail steel bars are at 1.90c, mill. On stock bars local warehouses are quoting 2.50c to 2.60c, Pittsburgh and 3.10c, Cleveland.

Awards Small; Prices Steady

Cincinnati, Dec. 9.—Prices on reinforcing concrete bars for shipment out of warehouse stocks have not been increased and the market generally on stock material now is 2.10c, base Pittsburgh. Lettings during the past week have been small, but the tonnage in prospect is increasing. The bulk of the new projects involve school buildings on which plans are rapidly being completed. Considerable road work also is contemplated, but it is expected that not much of this will be undertaken until next spring, owing to the winter season.

CONCRETE CONTRACTS PLACED

Awards this week	2,275 tons
Awards last week	6,304 tons
Awards two weeks ago	5,615 tons

1200 tons, warehouse building on Atlantic avenue, Boston, for Harvard Trust Co. to Concrete Steel Co. General contractor, Fred T. Ley Co.

400 tons, Dorchester tunnel, Boston, to independent fabricator. General contract to Coleman Bros., Inc.

200 tons, Illinois road work, to the Concrete Steel Co.

150 tons, Pacific Steamship Co. terminals, Seattle, Wash.; to Pacific Coast Steel Co.

125 tons, Jacobson Auto Co. garage at Madison, Wis., to Kalman Steel Co.

100 tons, high school, Warwick, R. I., to Rowley Construction Co., Pawtucket, R. I.

100 tons, Mason street bridge, Milwaukee, to Olney J. Dean & Co.

CONCRETE CONTRACTS PENDING

600 tons, water works department of Springfield, Ill.; bids in.

500 tons, 10 or 11-story building for Western Reserve university medical group, Cleveland; bids in Dec. 27.

300 tons, Boston police station; bids being taken. General contract to Jos. Rugo.

220 tons, Twelfth avenue south bridge approach, Seattle, Wash.; L. Romano, low bidder for general contract; Pacific Coast Steel Co. low bidder on steel reinforcing material.

210 bars, 5-story plant Mission and Bond streets, San Francisco, for Alcone Knitting Co.; general contract to Cahill Bros., 55 New Montgomery street, San Francisco; steel not yet placed.

200 tons, Kinzie building, Chicago. Revised plans out by David Saul Klafter, 64 West Randolph street, Chicago.

200 tons, school, Buffalo, N. Y.; bids to be taken shortly.

170 tons, proposed Sellwood bridge, Portland, Oreg.; bids Jan. 7, 1925 by county commissioners; Gustav Lindenthal, engineer.

120 tons, 72 tons for work at Jefferson, Tex., federal aid project No. 365, and 48 tons for Frio county roadwork, Pearsall, Tex.; bids in.

108 tons, unit No. 2, federal aid project, No. 451-B, Vernon, Tex.; bids taken until Dec. 12.

100 tons, 27 tons for highway No. 4, Carthage, Tex., bids in Dec. 15; 23 tons, Montgomery, Ala., bids in Dec. 17, and rest for Seymour, Tex., bids in Dec. 16.

Tonnage unstated, 7-story garage at 606 South Wabash avenue, Chicago, for Wabash Garage Co. Plans being drawn by Foltz & Brand, 570 North Dearborn street, Chicago.

Tonnage unstated, 3-story building for General Furniture Co. at Belmont and Seminary avenues, Chicago. Plans being drawn by I. S. Stern, 35 South Dearborn street, Chicago.

Tonnage unstated, reinforced concrete stadium for Northwestern university, Evanston, Ill. Plans being drawn by James Gamble, New York.

Tonnage unstated, 8-story building, 110 x 125 feet, for Charles Kasik, Milwaukee. Plans by A. L. Alschuler, 28 East Jackson boulevard, Chicago.

Unstated tonnage, 34-story addition to Roanoke building, Chicago; plans being drawn by Holabird & Roche, 104 South Michigan avenue, Chicago.

Pipe Makers

Miscellaneous Business Still Good—Cast Buying Continues Active

PIPE PRICES, PAGE 1541 AND 1598

Pittsburgh, Dec. 9.—Miscellaneous business continues to accrue to the several pipe makers in the Youngstown and Wheeling districts. This mainly originates with jobbers of standard full weight merchant pipe since they are experiencing a steady drain upon their stocks and must replenish to keep them well balanced. A fair sized order book exists on oil country goods made up of small orders from scattered buyers, both users and jobbers although this line is more quiet than it was a month or two ago. Line pipe business is slim, no large lots being closed up although one or two are understood to be scheduled for early placement. Operations in pipe finishing continue at 60 to 70 per cent of capacity.

Several Projects Near Closing

New York, Dec. 9.—The local department of water, gas and electricity is active in the cast iron pipe market. About 1000 tons of 20 and 24-inch pipe are involved in a project, on which contractors bids went in Dec. 6 with the Riverdale Contracting Co. low, and another inquiry is expected to be brought out by the city shortly. Bids on the general contract for buying and laying about 500 tons of pipe, scheduled for opening Dec. 3, have been held off indefinitely. The Warren Foundry & Pipe Co. is low on 300 tons for Yonkers, N. Y. The market as a whole is firm.

Municipal Buying Light

Chicago, Dec. 9.—Public utilities continue to be the backbone of the present buying of cast iron pipe. Municipal buying is confined to small lots. The National Cast Iron Pipe Co. is the low bidder on the standard sections of the 2000 tons of 6 and 16-inch pipe on which Detroit opened bids Dec. 3. The range on cast iron pipe 6 inches and over, at Chicago, continues $47.20 to $48.20, with 4-inch pipe $4 higher.

Soil Pipe Prices Up $5

Birmingham, Ala., Dec. 8.—Cast iron pipe plants in the Birmingham district are operating at a good rate. Demand for various sizes of pipe, both gas and water pipe and sanitary or soil pipe is good. Quotations for soil pipe have advanced $5 per ton and further advances are in sight. The gas and water pipe prices still are weak, $40 being given as the quotation for 6-inch and over, with reports from other sections that concessions are being made on this price. The American Cast Iron Pipe Co. announces a week shut down for holidays. McWane Iron Pipe Co. announces additions to the plant which will increase materially

the foundries producing 1¼ to 6-inch gas and water pipe.

CAST IRON PIPE PENDING

2000 tons, 6 and 16-inch pipe for Detroit; National Cast Iron Pipe Co. low bidder.

1000 tons, 20 to 24-inch pipe for the department of water, gas and electricity, New York City, the Riverdale Contracting Co. low on the general contract; 500 tons for the same department; date of receiving general contractor's bids, originally set for Dec. 3, indefinitely postponed.

649 tons, 4 to 16-inch cast iron pipe for El Centro, Cal.; bids opened Nov. 25, American Cast Iron Pipe Co., San Francisco, low bidder.

500 tons, work for New York; action postponed indefinitely.

383 tons, cast iron pipe, 4 to 8-inch class B and class C in 12-foot lengths for Los Angeles; bids opened Nov. 28 by James P. Vroman, secretary department of public service.

300 tons, project in Yonkers, N. Y.; Warren Foundry & Pipe Co., low bidder.

289 tons, 10, 12 and 14-inch iron or steel pipe for board of water commissioners, St. Helens, Oreg.; bids opened Dec. 3.

206 tons, including 9400 linear feet of 6 and 8-inch cast iron pipe and 1050 linear feet of 2-inch galvanized iron pipe, hydrants, etc. for Everett Pulp & Paper Co., Lowell, Wash.; low bidder H. W. Troutman, Seattle, at $23,580.

180 tons, Glasgow, Ky.; bids to be called shortly.

138 tons, 4, 6 and 16-inch class B cast iron pipe; bids opened Dec. 1 by H. H. Hunter, city clerk, Huntington Park, Los Angeles.

Valley Producing Highest Rate Since March

Youngstown, O., Dec. 9.—Substantial increase of buying has placed operations of steelworks throughout the Mahoning valley on the highest basis since last March. Independent producers of open-hearth steel here have 83 per cent of their equipment engaged compared with 75 per cent a week ago. The Youngstown Sheet & Tube Co. expanded its steelmaking schedule and now is charging 17 open hearths at its two divisions. The Republic Iron & Steel Co. has 13 open hearths active, the Trumbull Steel Co. seven and the Sharon Steel Hoop Co. six or a total of 43 of the 52 independent units.

A sharp increase in the number of active sheet mills brings district operation to 80 per cent of capacity, the highest since last March. This is an increase of 13 per cent since a week ago. Of the 101 sheet mills scheduled 23 are at the Youngstown Sheet & Tube Co., 14 at the Newton Steel Co., 15 at the Trumbull Steel Co., 12 at the Republic Iron & Steel Co., nine at the Sharon Steel Hoop Co., eight each at the Falcon Steel Co., the Thomas Sheet Steel Co. and the Mahoning Valley Steel Co. and four at the Waddell Steel Co. The Thomas Sheet Steel Co. recently electrified its mill and this week started two mills of its last unit affected by the change.

Miscellaneous operation includes four merchant, a hoop, two skelp and six pipe mills active at the Republic Iron & Steel Co.; eight pipe, a bar and plate mill at the Youngstown Sheet & Tube Co.; and 29 hot tin mills together with all stripmaking units at the Trumbull Steel Co.

The Rochester Foundries, Inc., Rochester, N. Y., filed a voluntary petition in bankruptcy recently, listing liabilities of $34,800.54 and assets of $197.

Sheet Orders Are Larger

All Mills Report Increased Demand—Specifications Provide Heavier Operations—Low Prices Disappearing

SHEET PRICES, PAGE 1541

Pittsburgh, Dec. 9.—Order books are growing among the sheet producers. One large interest here reports the receipt last week of specifications averaging approximately 11,000 tons daily, or at a rate of about 70 per cent in excess of capacity. Other producers report similar increases in specifications and as a result some are filling up, particularly on blue annealed and galvanized, for all they can make in January and most of February. For several days the American Sheet & Tin Plate Co. has been unable to accept any more blue annealed or galvanized sheet orders for shipment this year and it has no room for more in January and but little for February shipments. Before the week is out it will have no room for additional black sheet business for shipment before Jan. 1. It increased its sheetmaking capacity about 4 per cent last week, reaching 78 per cent, and is putting on the last idle plate and jobbing mill at Gary, giving it 100 per cent operations in plate and jobbing capacity for the first time in a long period. This, with the putting on of additional sheet mills at Mercer, will enable it to add 4 or 5 per cent more this present week. The independents are averaging around 75 per cent of capacity. Full-finished sheet demand has been heavy; January and part of February specifications already are in from five or six large automobile interests although no contracts have been written. A mixed situation is noted in prices. Some of the independents, while booked for first quarter at advanced prices, still are willing to accept business for delivery before Dec. 31 at low figures. While nothing below 2.70c in blue annealed is being developed, concessions occasionally occur in black and less frequently in galvanized. These concessions rarely if ever amount to more than $2 per ton. The galvanized quotation for first quarter is firm at 4.75c. Black sheets at 3.50c are available in the prompt market, with an occasional figure slightly under that but nothing under 3.60c is quoted for first quarter. While 4.60c is the prompt market price on full finished automobile sheets, 4.75c is the quoted market for first quarter delivery. In addition to domestic business from almost every consuming line, a few attractive inquiries for export are developing, including 500 tons of thin-gage black sheets for Japan, 1200 tons of galvanized sheets for the Philippines, and similar tonnages for shipment to other countries. More Japanese business in black sheets is scheduled to come out shortly after the first of the year.

Eastern Prices Stronger

Philadelphia, Dec. 9.—Sheet prices are stronger, due to improved operations. Eastern mills now are running 75 to 100 per cent. Blue annealed sheets are around 2.70c, Pittsburgh, a price of 2.60c being scarce. Black sheets are 3.50c to 3.60c and galvanized 4.60c to 4.75c. A good deal of first quarter business is on books at lower prices.

Mills In Stronger Position

Youngstown, O., Dec. 9.—Examination of conditions underlying the sheet market make it seem probable that the first quarter will develop a large demand. The market position this week is more favorable from the standpoint of prices. Whereas a week ago some mills were entertaining first quarter business at 2.60c, black at 3.50c and galvanized at 4.60c prices now are responding to the better buying trend and it is becoming more difficult to line up tonnage for forward delivery on this basis. The majority of producers here are quoting tonnages of blue annealed for first quarter at 2.70c, black at 3.60c and galvanized at 4.75c and are booking some business accordingly. Order books are in better shape now than for many months and with tonnage for this quarter's shipment becoming limited opinion prevails that the recently announced increase in the price levels will be established firmly by the end of this year if not sooner. Price firmness already is displayed in the blue annealed and galvanized grades for this year's delivery and an attractive tonnage would be required to obtain a price below 2.70c and 4.75c, respectively. One producer of the three grades of common sheets has withdrawn temporarily from the market while a maker of galvanized has closed his books. As for black, 3.50c still is applying on certain gages but indications point toward a decided strengthening before the end of this month. Buyers are sending specifications to the mills voluntarily now whereas a week ago mills were pressing for specifications. Orders for high-grade sheets are coming through but the volume is not indicative of acceleration. Reports coming from Detroit are that 5,000,000 automobiles are being planned for 1925 production and if this is the case better business is in store for sheet producers making this grade. Quotations on this grade are firm at 4.75c.

Sheetmakers will meet at Hotel Astor, New York, tomorrow for discussion of means for extending sheet distribution into new channels.

Blue Annealed Firmer

Chicago, Dec. 9.—Western delivered prices on blue annealed sheets now are said to figure back to 2.85c, base Gary and Indiana Harbor, making the Chicago delivered price 2.90c. Blue annealed activity is outstripping that in galvanized and black although in the two latter kinds of sheets, prices are squaring around and the situation is more satisfactory. Business in sheets has been decidedly better the past two weeks, and operations at local mills are close to 100 per cent. Western delivered prices on black sheets figure back to 3.70c, base Gary and Indiana Harbor, and on galvanized to 4.85c.

Announces First Quarter Prices

Cincinnati, Dec. 9.—The Newport Rolling Mill Co. has opened its books for first quarter business at the following prices: No. 10 blue annealed sheets 2.70c; No. 1 pass cold rolled steel sheets, 28 gage base, 3.60c, and No. 28 gage base flat galvanized, 4.75c. These prices are f.o.b. Pittsburgh.

Shape Contracting Drops

Smaller and Fewer Awards Follow Record Buying Movement of Past Two Weeks—Inquiries for Spring Building Large—Prices Stiffening

STRUCTURAL SHAPE PRICES, PAGE 1541

New York, Dec. 9.—Orders on the books for the structural shops in this district are mounting rapidly. Several shops are now booked four and five months ahead. This, in conjunction with the higher mill market, is forcing quotations on fabricated material higher. Prices on plain material are holding at a minimum, the equivalent of about 2.34c, New York, or 2.00c, Pittsburgh. Outstanding orders call for 4500 tons for a furniture exchange building in Lexington avenue, and 6000 tons for the Prudential building, Newark, which latter is reported as being awarded the Lehigh Structural Steel Co.

Builders Hurry to Cover

Boston, Dec. 9.—Active building prospects in the greater Boston district total some 10,000 tons of structural steel according to estimates of leading fabricators. Prices of structural shapes become firmer every day, and realizing this, prospective builders are hurrying to cover on tonnage desired for 1925 programs. The Statler hotel proposition at Boston calling for 6000 or 7000 tons is being revived actively. A combination warehouse and manufacturing building on Atlantic avenue Boston, calls for 2000 tons. The price of 2.365c delivered for shapes corresponding to 2.00c Pittsburgh is difficult to obtain in Boston at present and 2.05c is the market on moderate tonnages and 2.10c, on small lots. An advance from 1.80c Pittsburgh to 2.00c on plates is rumored.

Demand Quiet; Prices Firm

Philadelphia, Dec. 6.—Structural shape demand is quiet although the market is not clearly defined due to lack of test but the prices appear firm at 1.90c to 2.10c, base Pitstburgh. There is difficulty now in doing under 2.00c, on new tonnage. Mills generally are well sold ahead.

Awards Again Are Dwindling

Pittsburgh, Dec. 9.—Since the structural shape contracts coming to the American Bridge Co. involving 5000 to 10,000 tons each, as noted during the past week or two, jobs placed in this territory all involve small quantities. One structural interest making a canvass of the situation finds that a large number of jobs placed among many fabricators only aggregated 500 tons for the week. The American Bridge Co. was awarded 900 tons for an ore bridge at Lorain and received a contract for gate tracks for Dam No. 5 on the Ohio river, 165 tons. Competition still is keen on all jobs being figured although plain material is firm at 2.10c, the 2.00c base being confined to preferential customers' contracts. Included in inquiries pending are the following: One for 1300 tons for a 4-story building at Smithfield street and Sixth avenue, this city, and another for 4000 tons for an addition to the William Penn hotel.

Small Tonnage Being Placed

Cleveland, Dec. 9.—Demand for structural shapes is lacking and little tonnage was placed in the past week. Several large tonnages are pending with action expected shortly. One of these is the 1200 tons for the Euclid Baptist church. H. K. Ferguson Co. was awarded the general contract on the Ajax Mfg. Co. and steel probably will be purchased as soon as specifications are completed. Plain material purchases for stock are in larger volume. One engineering interest in this territory is inquiring for 2500 tons of plain material, probably for bridges. Featuring inquiry in outlying districts is that for 7000 tons for a hotel in Detroit and 4000 tons for bridge work in Steubenville, O. Plain material prices remain firm at 2.19c to 2.29c, Cleveland or 2.00c to 2.10c Pittsburgh. Fabricated prices are stiffer and less cutting by fabricators is noted as shops are booking more tonnage.

Spring Prospects are Brighter

Cincinnati, Dec. 9.—Each week sees prospects for a tremendous building program in the spring growing brighter. A large number of projects are developing in this territory. Bids will go in Dec. 10 on the new Tutweiler hotel, Birmingham, Ala., which will require 400 tons. Plans are being revised on the 5-story Knights of Columbus hall at Columbus, O., involving 500 tons. Awards the past week involved relative unimportant tonnages. The plain material price ranges from 2.00c to 2.10c, Pittsburgh.

Jobs Now Largely Prospective

Chicago, Dec. 9.—Fabricators have been exceptionally heavy buyers of plain material in the past week but this appears largely a protective measure in view of the rather light structural awards. A number of large jobs will probably develop after the turn of the year but for the moment most awards are in the neighborhood of 500 tons. The largest award of the past week is 4850 tons in a building at Los Angeles which went to the Llewellyn Iron Works. Plain material is quoted at 2.20c, Chicago.

STRUCTURAL CONTRACTS PLACED

Building awards this week ..... 29,968 tons
Building awards last week ..... 50,627 tons
Building awards two weeks ago.... 94,062 tons

7500 tons instead of 6000 tons, as reported in last week's issue, for the Penny loft, West Thirty-fourth street, New York; as previously noted the contract was placed through Starrett Bros. to the Hedden Iron Construction Co.

6000 tons, Prudential building, Newark, N. J., contract placed, order reported as going to Lehigh Structural Steel Co.

4850 tons, terminal building for Subway Terminal Corp., Los Angeles, to Llewellyn Iron Works.

4500 tons, furniture exchange building, Lexington avenue, between Thirty-second and Thirty-third streets, New York, to the Taylor-Fichter Steel Construction Co.

2000 tons, blast furnace work and plant extensions for Central Steel Co., Massillon, O., to J. E. Moss Iron Works; 2000 tons of plates for this work to Riter-Conley Co.

1400 tons, apartment at Park avenue and Sixty-fifth street, New York, to Easton Structural Steel Co.

1200 tons, extension of hot mill building to house six sheet mills, Seneca Iron & Steel Co., Buffalo, N. Y., to Bethlehem Steel Co.

1000 tons, apartment at Forty-ninth street and Eighth avenue, New York, to George A. Just Co.

900 tons, ore bridge, National Tube Co., Lorain, O., to the American Bridge Co.

750 tons, addition for fiber mill of the DuPont interests at Old Hickory, Tenn., to Belmont Iron Works.

750 tons, store for Moses Fox, Hartford, Conn., to Levering & Garrigues Co.

750 tons, Moss apartment, Ninety-sixth street, New York, to Bethlehem Fabricators, Inc.

600 tons, four bridges for the New York Central at De Pew, N. Y., to the Shoemaker Bridge Co.

500 tons, Bolivar road substation for the Cleveland Electric Illuminating Co., Cleveland, to American Bridge Co.

406 tons, bridge for Kaukauna, Wis., to Worden-Allen Co.

400 tons, Federal Reserve bank, Denver, to the American Bridge Co.

400 tons, apartment for the Parklex Holding Co., 14 East Ninety-eighth street, New York, to Bethlehem Fabricators, Inc.

350 tons, Northern Pacific railway bridges, to Milwaukee Bridge Co.

325 tons, building for the Kieckhefer Container Co., Belaire, N. J., to McClintic-Marshall Co.

265 tons, plant for Woodward-Tiernan Printing Co., St. Louis, to the Missouri Bridge & Iron Co.

250 tons, Milwaukee Corrugating Co. addition, to Worden-Allen Co.

250 tons, inspection shed for the Virginian railway at Mullen, W. Va., to the Virginia Bridge & Iron Co.

250 tons, fuel preparation building for the Consolidated Light & Gas Co., Baltimore, to be erected at Holtwood, Pa., to the Belmont Iron Works.

232 tons, addition to Argyle building, Kansas City, Mo., to the Kansas City Structural Steel Co.

225 tons, News building, Pottstown, Pa., to McClintic-Marshall Co.

200 tons, building for the Southern railway at Carswell, Va., to the Virginia Bridge & Iron Co.

165 tons, gate tracks, United States Engineer's office, Pittsburgh, for Dam No. 5, Ohio river, to the American Bridge Co.

150 tons, Bill's recreation building, Milwaukee, to Worden-Allen Co.

100 tons, Relief home, San Francisco, to Ralston Iron Works.

STRUCTURAL CONTRACTS PENDING

10,000 tons, Savoy hotel, New York; award expected daily.

7000 tons, hotel at Detroit; bids being taken.

4000 tons, 22-story addition to William Penn hotel, Pittsburgh; bids being taken.

4000 tons, bridge for Pennsylvania railroad for Steubenville, O.; bids being taken.

3600 tons, five railroad bridges Yosemite Valley railroad for Merced irrigation district; bids under advisement until Dec. 2; H. P. Sargent, secretary, Merced, Cal.

3200 tons, Jackson Shore hotel, Chicago; Fridstein & Co., 111 West Washington street, Chicago, engineers.

3000 tons, office building at Broad and Lucas streets, Philadelphia; pending.

3000 tons, Brisbane apartment, New York; Todd, Robertson & Todd, 347 Madison avenue, New York, engineers.

2000 tons, Harvard Trust building, Atlantic avenue, Boston; plans out.

1500 tons, four bridges for the Baltimore & Ohio railroad; pending.

1300 tons, 4-story building at Smithfield street and Sixth avenue, Pittsburgh; bids in.

1225 tons, structural and 76 tons of cast steel for proposed Sellwood bridge, Portland, Oreg.; bids received by county commissioners Jan. 7, 1925; Gustav Lindenthal, engineer.

1200 tons, apartment at 10 East Ninety-seventh street, New York, for Longacre Engineering & Construction Co., 347 Madison avenue; pending.

1000 tons, apartment, Seventy-second street, New York, for Barras Construction Co., 366 Madison avenue, New York; pending.

900 tons, Alexander Hamilton theater, Paterson N. J.; bid asked.

800 tons, power plant for the Water Reed Power Co., in South Carolina; bids asked.

750 tons, theater at New Orleans for the Marcus Loew interests, New York; pending.

600 tons, county office building, Elizabeth, N. J.; pending.

600 tons, Twelfth avenue south bridge approach, Seattle, Wash.; L. Romano low bidder for general contract; Wallace Equipment Co.

low bidder for structural materials.
500 tons, apartment building, Commonwealth avenue, Boston; bids being taken.
500 tons, warehouse, Brookline, Mass., for the Park Square Realty Co., Boston; bids being taken.
500 tons, Knights of Columbus hall, Columbus, O.; plans being revised.
500 tons, garage at 412 East Ninetieth street, New York; pending.
500 tons, apartment on Fifth avenue, New York, for Barras Construction Co., 366 Madison avenue, New York; pending.
450 tons, Union Institute of Savings, Boston; pending.
450 tons, apartment Jackson and Steiner streets, San Francisco; bids opened Nov. 24 by Henry C. Smith, architect, Humboldt Bank building, San Francisco.
450 tons, apartment building, 390 Beacon street, Boston; bids being taken.
400 tons, Tutweiler hotel, Birmingham, Ala.; bids in Dec. 10.
400 tons, garage, 509-20 Thirty-fourth street, New York; pending.
400 tons, Peoples Trust Co., Flatbush Church avenue, Brooklyn, N. Y.; pending.
350 tons, buildings for Ajax Mfg. Co., Cleveland; general contract awarded to the H. K. Ferguson Co., that city.
300 tons, plant for N. S. Holding Co., Long Island City, N. Y., White Construction Co. awarded general contract.
300 tons, Mahony building, Elizabeth, N. J.; pending.
300 tons, 8-story building at Fortieth street; New York; pending.
250 tons, Union Trust building, Boston; bids being taken.
250 tons, Harvey apartment, Ashburton street, Boston; bids in.
200 tons, bridge for the Southern railway; bids asked.
200 tons, highway bridge for the Central of New Jersey railroad; pending.
175 tons, bridge at Ashtabula Harbor, O.; bids being taken by county commissioners until Dec. 22.
148 tons, bridge at Horseshoe Bend, Idaho; pending.
125 tons, flange and copper bearing plate for 36-inch pipe line, Tacoma, Wash; bids Dec. 3.
100 tons, bridges at Salina, Wans.; bids Dec. 11.
Tonnage unstated, Rock Island bridge requirements; pending.
Tonnage unstated, machine shop for Hubbard Steel Foundry Co., East Chicago, Ind.; pending.
Tonnage unstated, 34-story addition to Roanoake building, Chicago. Plans being drawn by Holabird & Roche, 104 South Michigan avenue, Chicago.
Tonnage unstated, theater building for B. F. Keith interests at Akron, O.; pending.

Warehouses Follow Mill Prices Upward

WAREHOUSE PRICES, PAGE 1600

Cleveland, Dec. 9.—Advance of local iron and steel warehouses of cold-finished rounds and shapes of $2 a ton is the first price raise among local jobbers for several months. Other products are quoted firmly at prevailing levels, with shading less common. A general price advance in all products is not expected until after the holiday period. December sales are at a surprisingly high rate for this season, but are dropping slightly from the levels of November.

Cold Finished Is Advanced

New York, Dec. 9.—An advance of 10 points in cold-finished steel by the leading independent jobber features the local warehouse market. Rounds now are being quoted at 4.15c and flats, squares and hexagons at 4.65c. This advance is fast being put into effect by other jobbers. The stiffening of mill prices is a dominating factor.

A petition in bankruptcy has been filed against the Lucey Mfg. Corp., 233 Broadway, New York, by Henry C. Field, for $1000; the McKiernan-Terry Drill Co., $293 and Corlies, Macy & Co., Inc., $200.

Interest Revives In Cars

Rock Island, St. Louis Southwestern and Cotton Belt Place 1000 Each—Three Roads Seek 6000—Await Award 150,000 Tons Rails

RAILROAD TRACK MATERIAL PRICES, PAGE 1541

New York, Dec. 9.—Car awards in November involved 12,720 cars, according to a compilation just made. This compares with 4885 cars placed in October, and is larger than any month since March, with the exception of September, when 27,630 cars were placed. Further comparisons follow:

Total for 11 months	125,950
November	12,720
October	4,885
September	27,630
August	5,980
July	886
June	438
May	511
April	10,250
March	13,150
February	41,350
January, 1924	8,150
1923 total	103,487

The current market is featured by substantial inquiries from the Missouri Pacific, Louisville & Nashville, and the Norfolk & Western. Awards are light. Locomotive buying includes 16 for the Louisville & Nashville, 18 for the Florida East Coast, and 15 for the Southern Pacific placed with the American Locomotive Co. The New York Central has closed on 35 tenders with the American Locomotive Co. in addition to 15 with the Lima Locomotive Works, Inc., as reported last week.

The New York Central has put out an inquiry covering its requirements over the first quarter, bids to be opened Dec. 19. It involves not over 1000 tons of bars, 1000 tons of plates or 1000 tons of shapes; it also covers nails, wire, tubes, axles, sheets, billets, etc. This road just has placed a large tonnage of track spikes, understood to involve over 50,000 kegs. The road also is in the market for tie plates.

The Pennsylvania railroad has put out a tentative inquiry for 100,000 tons of rails for 1925. It is expected to buy altogether 150,000 to 200,000 tons. The Southern Pacific has placed 22,500 tons of rails with the Tennessee Coal Iron & Railroad Co. for next year.

The Great Northern has purchased four locomotives from the Baldwin Locomotive Works.

German interests are reported low bidders on 200 miscellaneous freight cars for the Siamese State railways.

Indications point that no definite action will be taken on the Pennsylvania railroad inquiry for its 1925 rail requirements until January.

Ready To Buy for 1925

Boston, Dec. 9.—Actual orders for rails and railroad material are slow in developing although New England roads are known to be near the point of buying. The Eastern Massachusetts street railway placed orders for about $50,000 worth of frog and switch material.

Competition Exceedingly Keen

Pittsburgh, Dec. 9.—Indicative of the exceedingly keen competition existing on billet-rolled light rails, one maker recently went to 1.75c on a small quantity. The usual prices on single carloads up to 100 or 150 tons are 1.80c to 1.90c. Track accessories continue fairly active, a number of small orders being placed every day or so. The New York Central railroad placed a large quantity of standard spikes, tie plates, etc., and a maker here obtained an order from this road for 15,000 kegs of track bolts. The market on track bolts remains unchanged at 3.75c to 4.00c.

Closing for Rail Tonnage

Cleveland, Dec. 9.—The Wheeling & Lake Erie railroad will require 4000 tons of rails for 1925 delivery. However, it is carrying over unspecified from 1924, 2300 tons so that the new purchase amounts to but 1700 tons. The Nickel Plate railroad as yet has done nothing against its inquiry for 20,000 tons.

Rails To Be Placed

Chicago, Dec. 9.—Estimates of rails about to be placed by the Rock Island, Chicago & North Western, the Pere Marquette and Soo Line within the next few days range from 110,000 tons to 120,000 tons.

The Chicago & North Western and the Rock Island rails are expected to carry with them a total of 8000 tons of angle bars, 8000 tons of tie plates and 4000 tons of spikes and bolts The Chesapeake & Ohio is inquiring for 25,000 kegs of spikes and bolts. One maker in the past week has booked in miscellaneous orders 3500 tons of angle bars, 1700 tons of tie plates and 5000 kegs of spikes.

The Cotton Belt has placed 1000 box cars with the Mt. Vernon Car Mfg. Co. and the Rock Island 1000 refrigerators with the Pressed Steel Car Co. The Missouri Pacific is considering 3000 box and automobile cars in addition to 750 gondolas and 250 hoppers.

CAR ORDERS PLACED

Central of Georgia, 500 box cars, to the Tennessee Coal, Iron & Railroad Co.
Chicago & North Western, 39 passenger cars, to the American Car & Foundry Co.
Cotton Belt, 1000 box cars, to the Mt. Vernon Car Mfg. Co.
Cranberry Creek Coal Co., two dump cars, to the Clark Car Co.
Florida East Coast, 10 tank cars, to the General American Tank Car Corp.; 13 coaches to the Pullman Car & Mfg. Co.
Rock Island, 1000 refrigerators, to the Pressed Steel Car Co.
St. Louis & Southwestern, 1000 box cars, to Mt. Vernon Car & Mfg. Co.
Union railway, 500 hopper car bodies, to Greenville Steel Car Co.
Wabash railroad, 25 cabooses, to American Car & Foundry Co.
Western Pacific, 70 stock cars, to Pacific Car & Foundry Co.

CAR ORDERS PENDING

American Oil Co., Baltimore, is understood to have withdrawn its inquiry for 10 to 100 tank cars.
Ford Motor Co., 25 cabooses; bids asked.
Louisville & Nashville, 1000 gondolas; pending.
Missouri Pacific, 4000 cars, including 2000 box cars, 1000 automobile cars, 750 gondola cars, and 250 hopper cars, pending; also 35 miscellaneous coaches.
Northern Pacific, 1000 box cars; pending.

By-Product Sales

Keeping Up With Increased Output—Quotations Unchanged

New York, Dec. 9.—Quotations on coal by-products generally are unchanged. Production continues to increase steadily but demand appears to be keeping pace. Sellers of light oil distillates assert that industrial buying is unusually good for this season of the year.

Pure benzol is holding at 25 cents works in tank lots and 30 cents in drums; 90 per cent, 23 cents in tanks and 28 cents in drums; toluol, 26 cents in tanks and 31 cents in drums; solvent naphtha, 25 cents in tanks and 30 cents in drums, and commercial xylol, 26 cents in tanks and 31 cents in drums.

Sulphate of ammonia for domestic account is being quoted at $2.65 to $2.70 works. There is little current demand; nevertheless, contract orders entered into earlier in the year, are absorbing the great bulk of the output. Export demand continues quiet, with prices nominal.

Consumers of naphthalene are now contracting substantially for their spring requirements, with the market on material in carload lots going at around 5½ to 6 cents for flakes and 6½ to 7 cents for balls. Spot demand is negligible. Phenol is featureless with the price unchanged at 27 cents local warehouse for spot shipment and 25 cents for futures.

Coke Oven By-Product

Spot*

Per Gallon at Producers' Plants in Tank Lots	
Pure benzol	$0.25
Toluol	0.26
Solvent naphtha	0.25
Commercial xylol	0.26
Per Pound at Producers' Plants	
Phenol	0.27
Naphthalene flake	0.05½ to 0.06
Naphthalene balls	0.06½ to 0.07
Per 100 Pounds at Producers' Plants	
Sulphate of ammonia	$2.65 to 2.70
Contract	
Pure benzol	Nominal
Toluol	Nominal
Solvent naphtha	Nominal
Commercial xylol	Nominal
Per Pound at Producers' Plants	
Phenol	$0.25
Naphthalene flakes	0.05½ to 0.06
Naphthalene balls	0.06½ to 0.07

*Spot distillates are subject to shading.

Scrap Level Is Higher

(*Concluded from Page* 1542)

more than $14.50 for heavy melting steel. Mills in this district are operating 80 to 90 per cent of capacity, but are buying on a relatively small scale, many prefering to enter the inventory period with as small stocks as possible. More material is coming on the market than in several weeks. The Louisville & Nashville railroad has a list involving 8,000 tons, the Norfolk & Western 9,000 tons, and the Southern Railway a large tonnage.

Cleveland Trading Quiet

Cleveland, Dec. 9.—Trading in iron and steel scrap is exceedingly quiet in this district. Consumers claim to have sufficient stock to carry them well beyond the first of the year and do not desire to add to inventories. Prices are unchanged but fairly firm. However, scrap users regard the market as too strong, being inclined to believe it must soften before much tonnage is moved.

St. Louis Demand Strong

St. Louis, Dec. 8.—Continued strength features the market for iron and steel scrap with further advances on a number of important items. Steel mills, which of late have booked substantial orders for their products, are buying, and more activity is displayed by other melters. Rolling mills are manifesting more signs of life, and grades suitable for their use are in better demand. With the exception of stove plate and railroad grate bars, which are relatively quiet, the entire list shows decided activity and an upward trend.

While it is evident that consumers, particularly steel mills, will need more scrap, it is not likely that much tonnage will be placed before the middle of January, or even later. Scrap under contract is rolling in volume, and most plants have about all they need for present melting. Some users are temporarily overstocked, and the Laclede Steel Co. has embargoed against rails for rolling. Railroad offerings were confined to 5500 tons by the Missouri Pacific, but several lists are expected during the next few days.

Much Improvement Noted

Birmingham, Ala., Dec. 8.—Old material dealers in the Birmingham district tell of a decided change in conditions, selling having started for delivery in practically all instances, within 30 days. Quotations have advanced in all but a few items with indications of further increases shortly.

Increases Sheet Output

Six hot sheet mills will be installed at the Blasdell plant of the Seneca Iron & Steel Co., Buffalo, which when completed will give the company a layout of 20 units. Construction work was started this week. The new units will have an annual production of 30,000 tons, making the aggregate output of the plant about 110,000 tons. The structural work will be executed by the Lackawanna Structural Steel Corp., Buffalo.

Buying More Strip

STRIP PRICES, PAGE 1541

Pittsburgh, Dec. 9.—Commitments in hot and cold-rolled strips are expanding with slightly increased sales effort on the part of manufacturers. While customers have shown more anxiety to get under cover for first quarter requirements the past week or so, makers are not inclined to obligate their output fully for that period believing that higher figures will prevail later. Some have not obligated themselves beyond 25 to 40 per cent of probable first quarter production. An increasing number of prompt cold strip sales are noted at 4.15c, which is the firm level for first quarter and in connection with hot strips a tendency is developing to name 2.40c, wiping out the 2.25c figure on 3-inch material. December operations on the basis of 70 to 75 per cent of capacity will average 25 per cent higher than November.

Heavy Contracting

Done in Ferrosilicon and Ferrochrome —Scattered Sales In Other Metals

FERROALLOY PRICES, PAGE 1541

New York, Dec. 9.—A large contract business has been done in ferrosilicon and ferrochrome for 1925 deliveries. The prices on ferrosilicon are as quoted, $82.50, delivered, for 50 per cent; $145, delivered, for 75 per cent; and $42, furnace, for 14 to 16 per cent. Contract business has been done in ferrochrome of 4 to 6 per cent carbon content, at 11-cent a pound contained for large quantities, to 11.50 cents for moderate quantities.

Ferrotungsten prices range from 82 to 88 cents a pound continued. This range is nominal, as a tendency is growing among steelmakers to buy their own ore and have the ores reduced by converters on a toll basis. Tungsten ore prices have advanced to $8.75 to $9 a short ton unit. Other alloys and ores are unchanged.

More ferromanganese buying is being done than in recent weeks due to the fact that consumers now know they will need more of this metal in the first quarter than they had anticipated. The market appears firm at $105, duty paid tidewater.

Sales of fully 1000 tons of spiegeleisen have been made during the past week at prices ranging from $31 to $3, furnace, for the 20 per cent grade. The deliveries involved range all the way up to the end of the first quarter.

Straggling Sales Are Made

Pittsburgh, Dec. 9.—With most of the ferroalloy users now under contract for the first quarter or first half, straggling sales only are being made. Some are coming in for ferromanganese and are paying the $105 seaboard price maintained by domestic producers and by importers of English material. Sales this past week aggregated approximately 1000 tons. The price on German ferromanganese was increased from $100 to $102.50, seaboard base, and again was advanced late last week to $104, but consumers are disinclined to purchase. Some Norwegian ferromanganese still is being offered at comparatively low figures and some Indian material, which is guaranteed 75 per cent, is quoted at less than $100. A few less-than-carload lots of English material have been moved in barrels from warehouses, one involving a few tons bringing $134.20 delivered.

Practically all consumers of 50 per cent ferrosilicon now are under contract for all of 1925 and the $82.50 delivered price is holding. One inquiry involving 80 pounds of ferrovanadium is out and on the high grade material $3.65 to $3.75 is quoted. Ferrotungsten demand is slim. In spiegeleisen, numerous small sales are recorded each week and one used protected for the first quarter has just contracted for 500 tons additional for second quarter. The price is unchanged at $31 to $33.

Nonferrous Metal Markets

Prices of the Week

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Spot Tin, N. Y. Straits	Lead New York	Lead St. Louis East	St. Louis Zinc	Aluminum 98-99%	Antimony Spot	Nickel Ingot
Dec. 3	14.25	14.37½	13.75	54.87½	9.00	8.75	7.02½	27.00	14.50	29.00
Dec. 4	14.25	14.37½	13.75	55.25	9.00	8.70	7.00	27.00	14.50	29.00
Dec. 5	14.25	14.37½	13.75	54.87½	9.05	8.70	6.95	27.00	14.50	29.00
Dec. 8	14.25	14.37½	13.75	54.75	9.05	8.75	7.00	27.00	14.50	29.00
Dec. 9	14.25	14.37½	13.75	55.12½	9.12½	8.75	7.10	27.00	14.50	29.00

NEW YORK, Dec. 9.—Nonferrous metal markets have maintained their strength of a week ago and have continued active. Confidence in the 1925 outlook is manifested both by selling policies of producers and buying policies of consumers. A large contract business has been done in various lines, including the automotive and public utility fields, for first half of next year. A feature of the metal markets this week has been the sharp advance in sterling exchange to above $4.70, a net gain for seven business days of 8 points. This has resulted in elevating metal price equivalents in our currency abroad, and has more than offset slight reactions in the London metal quotations. These reactions probably were in the nature of an exchange adjustment.

Copper—Electrolytic copper has held firmly at 14.25c, delivered Connecticut, for prompt and first quarter deliveries, and at 14.37½c, delivered middle western points. Business has been done in fair volume at these prices. Just before the market advanced from 14.12½c, an extremely heavy business was done. Six agencies sold 52,000,000 pounds in four days, a record for a long time. Europe has bought sparingly the past few days, being unwilling to pay the American asking price of 14.40c, c.i.f. foreign port. However, comparatively little resale metal has been offered by dealers abroad and producers have shown an attitude of waiting on their market. Lake copper has held at 14.25c to 14.37½c, delivered.

Copper wire—Public utilities have placed heavy business in wire and cable for the first half of 1925. The price of bare copper wire advanced ¼ cent Dec. 1 to 16.00c to 15.25c, base mill; weatherproof, 17.75c to 18c; magnet, 18c to 18.25c. These are open market prices.

Rolled products—The base prices of copper and brass rolled products have not changed since the advance of Dec. 1. A good business has been closed since the market reached a 14.25c ingot basis and mills are comfortably booked for the first two months of 1925. The base price of sheet zinc remains 10.75c, base mill. The price to jobbers of full lead sheets is 11.25c and to plumbers, 12.50c.

Zinc—European buying of zinc reappeared on the recent reaction in prices from 7.10c to 6.95c, East St. Louis, whereupon our market quickly rebounded above 7c. The reaction was due to realizing sales by speculators who were able to show a profit from the previous rise. The November statistics for slab zinc will be published this week and are expected to be favorable. Smelters are selling carefully.

Lead—The deadlock in the lead market is unbroken. The two largest factors continue to sell a limited tonnage to regular customers below the open market. Consumers who are unable to satisfy current requirements at these sources are paying as high as 8.95c East St. Louis and 9.10c to 9.25c New York, since the American Smelting advance Monday to 8.75c New York on contracts. Demand has been increasing in the open market.

Tin—The tin market has been slipping a little in London, but increasing sterling exchange rates have kept our import costs up. The price of spot and future Straits has ranged between 54.50c and 55.25c, this week. The world visible supply increased 2000 tons in November, reflecting release of stocks from the Eastern pool.

Aluminum—A large amount of aluminum business has been closed for first half of 1925 by the domestic producer and the two importing agencies representing foreign producers. Prices on this business are unchanged at 27c for 98 to 99 per cent and 28c for 99 per cent virgin ingot.

Antimony—The price of spot antimony, also December delivery, has been maintained at 14.50c, duty paid, by the holders here. The future market, however, has broken sharply on offers of December shipment from the Orient down to 13.87½c, duty paid, without takers here.

Old metals are strong.

Metals Continue Strong With Active Markets Here and Abroad

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled	21.62½
High brass	18.37½
Zinc, ga. 9 to 18 (plates ½c less)	10.75
Lead, full sheets (cut ¼c more)	12.50
Aluminum, bright, 0 to 35 gage	37.50 to 92.00
SEAMLESS TUBES	
High brass	22.75
Copper	24.00
RODS	
High brass, round, ⅝ to 2½-inch	16.37½
Naval brass rods	18.87½
WIRE	
Copper	15.87½ to 16.12½
High brass	18.87½

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
New York	8.50
Chicago	9.50
Cleveland	9.50
HEAVY YELLOW BRASS	
New York	6.75 to 7.00
Chicago	7.75 to 8.00
Cleveland	7.25
ZINC	
New York	3.75 to 4.00
Chicago, dross	5.00
Cleveland	3.75
HEAVY COPPER AND WIRE	
New York	11.25
Chicago	11.50
Cleveland	11.50
RED BRASS TURNINGS	
New York	8.00
Chicago	9.00
Cleveland	9.00 to 9.25
YELLOW BRASS TUBING	
Cleveland	7.50
NO. 1 BRASS ROD TURNINGS	
New York	7.50 to 7.75
Chicago	8.00
Cleveland	7.75
LIGHT COPPER	
New York	9.50
Chicago	10.00 to 10.50
Cleveland	9.75
LIGHT BRASS	
Chicago	7.00
Clippings, Chicago	9.50
ALUMINUM	
Borings, Cleveland	11.50 to 12.50
Old sheet, Cleveland	16.50 to 17.00
Clippings, Cleveland	21.00

Secondary Metals

Remelt aluminum No. 12	22.00 to 22.50
Brass ingot 85-5-5-5	12.00 to 12.50

Ore Stocks Low; Price Views Firmer

ORE PRICES, PAGE 1598

Cleveland, Dec. 9.—Some small sales of Lake Superior iron ore were made during the week and others are being negotiated. One lot of 50,000 tons is pending. More activity of this character may develop, as blast furnaces seek tonnages for filling-in. Stocks at furnaces and lower lakes docks are comparatively low, and ore sellers say some furnaces may have difficulty during the winter in obtaining the grades best suited for their particular purposes. A shortage is not anticipated. It is said that if users wish to buy ore for rounding out this season's supply open market prices of this year will apply, but if tonnage is desired to increase stocks for next year, higher prices will be asked. A decidely stronger tone prevails in the trade, and some sellers are predicting a price advance of at least 50 cent for next year.

The amount of ore on Lake Erie Docks Dec. 1 was 8,049,276 tons compared with 8,756,505 tons a year ago. It is estimated by some producers that stocks at lower lake ports and furnaces on May 1 will be 2,500,000 to 3,000,000 tons below normal.

Antonio Mondrene, boilermaker, Rotterdam Junction, N. Y., has filed a petition in bankruptcy at Rochester, with liabilities listed at $10,828 and assets and secured claims of $115.

Steel Ingot

Total Loses in November But Daily Rate Makes a Gain

Although the total production of steel ingots in November was 4226 tons less than the October output, daily average production showed an increase of 9050 tons per day, or 7.8 per cent. The slight loss in aggregate tonnage is accounted for by the fact that November had 25 working days, as compared with 27 in the preceding month. According to statistics compiled by the American Iron and Steel institute from reports supplied by companies making 94.84 per cent of the country's total in 1923, the total November production amounted to 3,107,226 gross tons. The output of October was 3,111,452 tons. Production of the reporting companies in November was 2,946,893 tons, a loss of 4008 tons from the 2,950,901 tons of the previous month.

The approximate daily average of the country in November was 124,289 tons, compared with 115,239 tons in October. The November rate is 36,786 tons per day below the March rate, the high point of the year and for all time. Production in November represented 77.5 per cent of that of March. However, it is 52,388 tons per day, or 73 per cent, above the 71,901-ton low point of July. The increase of October over September was 6.4 per cent. On the basis of 311 working days in the year and a daily production of 124,289 tons for November, the annual indicated rate of production was 38,650,000 tons. The indicated rate for all of October was 35,840,000 tons.

Comparisons of steel ingot production by months for 1923 and the first 11 months of 1924, as compiled by the institute are shown in the accompanying table.

Steel Ingot Production, 1923-24

94.84 Per Cent of Industry Reporting Gross Tons

1923	Open-hearth	Bessemer	All other	Monthly production companies reporting	Calculated monthly production all companies	No. of working days	Approximate daily production all companies gross tons	Change in daily production per cent
Jan. ..	2,906,892	728,270	9,467	3,644,629	3,841,095	27	142,263	+ 7.7
Feb. ..	2,613,564	669,903	10,797	3,294,264	3,471,843	24	144,660	+ 1.7
Mar. .	3,046,309	799,525	12,841	3,858,675	4,066,680	27	150,618	+ 4.1
Apr. ..	2,974,579	772,485	13,933	3,760,997	3,963,736	25	158,549	+ 5.2
May ..	3,136,558	847,418	16,719	4,000,695	4,216,355	27	156,161	— 1.5
June.	2,821,239	737,845	15,483	3,574,567	3,767,256	26	144,894	— 7.2
July ..	2,658,449	680,884	11,496	3,350,829	3,531,458	25	141,258	— 2.5
Aug. .	2,796,370	701,059	9,326	3,506,755	3,695,788	27	136,881	— 3.1
Sept.	2,562,771	613,709	8,602	3,185,082	3,356,776	25	134,271	— 1.9
Oct. ..	2,735,513	649,452	9,163	3,394,128	3,577,091	27	132,486	— 1.3
Nov. ..	2,348,361	616,335	9,309	2,974,005	3,134,321	26	120,551	— 9.0
Total 11 Mos.	30,600,604	7,816,885	127,136	38,544,626	40,622,399	286	142,036	.....
Dec. ..	2,135,898	570,004	10,912	2,716,814	2,863,266	25	114,531	— 5.0
Total	32,736,503	8,386,889	138,048	41,261,440	43,485,665	311	139,825	
1924								
Jan. ..	2,766,534	667,032	12,577	3,446,143	3,633,639	27	134,579	+17.5
Feb. ..	2,902,641	695,905	14 085	3,612,631	3,809,185	25	152,367	+13.2
Mar. ..	3,249,783	706,801	15,260	3,971,844	4,187,942	26	161,075	+ 5.7
Apr. ..	2,575,788	573,381	12,356	3,161,525	3,333,535	26	128,213	+20.4
May ..	2,060,896	425,099	6,648	2,492,643	2,628,261	27	97,343	—24.1
June ..	1,637,660	310,070	2,622	1,950,352	2,056,466	25	82,259	—15.5
July ..	1,525,912	241,880	5,162	1,772,954	1,869,416	26	71,901	—12.6
Aug. ..	2,042,820	361,781	5,759	2,410,360	2,541,501	26	97,750	+36.0
Sept. .	2,252,976	409,922	6.844	2,669,742	2,814,996	26	108,269	+10.7
Oct. ..	2,505,403	438,468	7,036	2,950,901	3,111,452	27	115,239	+ 6.4
Nov. ..	2,479,147	459,349	8,398	2,946,893	3,107,226	25	124,289	+ 7.8
Total 11 Mos.	25,999,560	5,289,688	96,740	31,385,988	33,093,619	286	115,712	.....

Organize Dunbar Corp.

Philadelphia, Dec. 9.—A committee of bondholders of the old American Manganese Mfg. Co., Dunbar, Pa., after obtaining title to the properties of that company, have organized the Dunbar Corp., with William G. Gest, of the Fidelity Trust Co., Philadelphia, as president and Richard M. Marshall, vice president and general manager. No plans have been formulated as yet with respect to operation of the Dunbar furnaces.

Rebuilds Sheet Furnaces

Sheet and pair furnaces serving the 15 hot sheet mills at the East Youngstown division of the Youngstown Sheet & Tube Co. are being rebuilt to burn coke oven gas instead of producer gas. Two units at a time are being changed.

Installs New Mill Drive

Electrification of the 12 hot sheet mills of the Thomas Sheet Steel Co., Niles, O., recently was completed. One unit driving six hot mills was completed a few months ago; this week the installation of the No. 2 unit was finished and two of the six hot mills in this train placed in operation. The company now has eight mills scheduled.

Chicago Steel Fabricators Forming Merger

Chicago, Dec. 9.—Final details are being worked out whereby the McClintic-Marshall Co. is acquiring fabricating capacity in the Chicago district, according to reports current here. Rumor links the McClintic company with the Morava Construction Co. but officials of the latter organization refuse to talk. Reports are current lately that the Morava company, Hansell-Elcock Co., and Vanderkloot Steel Works might merge. W. Morava, president of the Morava Construction Co., has been credited with the desire to retire from active business and the properties of the latter two are becoming too valuable for industrial purposes. The only previous attempts to effect mergers of local independent fabricators were wrecked by the inability of parties concerned to agree as to valuations of the properties in question.

Gaskill Is Opposed as a Radical

Washington, Dec. 9.—Opposition is developing in the senate and other quarters against the recess appointment of Trade Commissioner Nelson B. Gaskill by President Coolidge, on the ground the former is radical. The opposition is remarkable since Mr. Gaskill has been considered one of the conservative members of the commission. His nomination was withheld from the senate although other recess nominations were sent in.

Commissioner Gaskill was indorsed by 760 members of the Western Association of Rolled Steel Consumers, despite his dissent in the Pittsburgh plus case. He never has been counted radical, although he voted for the Midvale-Republic-Inland merger complaint. Gaskill has filed an individual report with congress recommending improvements in the functioning of the trade commission which the commission refused to include in its regular annual report. His report shows a constant increase in the commission's work and impossibility of prompt relief to complainants or respondents under present methods. An increase in the commission's appropriation is not possible, owing to the President's policy of retrenchment.

Gaskill's recommendations look to development of self-government of business by its own members and lessening of external police regulation.

Harry C. Camp has been appointed receiver for the Conners Tool Works, Inc., Southington, Conn.

Spot Buying on Coast

Building Continues To Exceed Previous Year—Greater Interest Shown in Forward Buying on Belief Bottom Is Reached

SEATTLE, Dec. 4.—Features are lacking in the iron and steel market of the North Pacific coast. Buying is confined to immediate needs, although some promising business looms for early 1925. In the meantime dealers are unwilling to restock before inventory and no marked improvement is expected before next month.

The lumber industry is on a firmer basis, prices tending upward and buying increasing. Reports from Oregon and Washington mills for last week show new business was 28 per cent greater than production. This indicates a marked improvement over 30 days ago when new business averaged 6 per cent under output. Domestic lumber markets are more active and this strength is expected to be reflected in foreign markets shortly.

For the first 11 months of 1924 Seattle's building showed a valuation of $26,435,000 compared with $21,844,000 in the same period last year. Construction work continues active notwithstanding unfavorable weather and many ambitious projects are planned for the new year. Building operations in Portland to Dec. 1 exceeded the record during the entire 12 months of 1923 by $2,000,000 when the total of $26,202,000 was reached. In the first 11 months of 1924 Tacoma's building total reached $8,106,000, a gain of $3,000,000 over the same period of 1923. To Dec. 1, Spokane showed a gain of $500,000 over the entire year 1923. Vancouver, B. C., reports a gain of $500,000 in 11 months over last year.

Pig Iron and Coke

While there is little change domestic pig iron is firmer and with exchange strengthening foreign iron is advancing. Buying is not active but considerable iron has been ordered for first half of 1925. Columbia iron is selling well on a competitive basis with foreign grades and being shipped in analyses to suit the buyer and priced accordingly. The general opinion of the trade is that prices are at the bottom and greater interest is indicated in forward buying.

While the Fernie plant is again operating this grade of British Columbia coke is not selling so well as users generally are well stocked. While Fernie was not obtainable many users turned to domestic coke which is having a larger sale, although for some purposes higher grades are preferred.

Bars, Plates and Shapes

Demand for bars is quiet but not exceptionally so for the season. The local producer is operating intermittently. Tonnages are small and not many projects are up for figures. However, the outlook for 1925 is promising. Foreign bars are offering at 1.85c to 2.00c but little interest is being shown. Awards pending include 170 tons for the Sellwood bridge, Portland, bids Jan. 7. The Pacific Coast Steel Co. is low bidder for 220 tons for the Twelfth avenue bridge, Seattle.

Plates are firmer, best prices obtainable being 2.40c, an advance of 15 cents in 30 days. Not much business is pending. Coast yards are bidding on the Matson Navigation Co.'s new liner, bids to be opened Dec. 5. In this job are involved 8000 tons of plates and 4000 tons of shapes.

Shape awards of the week include 600 tons for the Twelfth avenue bridge, Seattle, on which Wallace Equipment Co. was low bidder. Business pending totals better than 5000 tons, including 3600 tons for five bridges for the Yosemite Valley railroad, California. Prices generally are firmer, buyers reporting that 2.35c is about the best offering.

Finished Materials

Warehousemen report that November business was less than October by possibly 25 per cent. Indications for forward business are good, although no extensive buying is expected before next month. Sheets, plates, tubes and rivets are showing a fair turnover, but no large tonnages. Jobbers are holding firm to present prices. In the Portland territory bars and plates are still 25 cents under this market but it is likely these items will be restored by Jan. 1 when a general advance is probable in line with higher mill prices.

The Bloedel-Donovan Lumber Mills have placed 250 tons of foreign rails with the Seattle Frog & Switch Co. This is for logging road construction in the Olympic Peninsula.

Several contracts for cast iron pipe are pending at various Coast points, the total amounting to about 1700 tons.

Old Materials

The market is dull, buyers lacking interest and prices being correspondingly weak. The main buying interest here is practically out of the market for steel scrap, which is nominally quoted at $8 gross, showing a drop of 50 cents in 30 days. Shippers are not being encouraged and receipts are light. There is no foreign inquiry. Cast iron scrap is weak at $18. Foundries are buying sparingly.

New Western Rates Ready

Chicago, Dec. 9.—Tariffs increasing class rates between Illinois points and the Twin Cities and Missouri river points are expected to be published by the railroads within a week. Whether shippers ask suspension of these tariffs will not be decided until the rates have been thoroughly studied. Some revisions have been made necessary by recent interstate commerce commission decisions, and shippers prefer to adjust differences directly with the carriers, if possible.

Great Wire Cable Made For Camden Bridge

Pittsburgh, Dec. 9.—About 25,100 miles of wire are being manufactured for the two steel cables, 30 inches in diameter, for the proposed Philadelphia-Camden bridge over the Delaware river, in the Monessen plant of the Page Steel & Wire Co. The wire will be turned over to the American Cable Co. and it will be formed into cables, each 3550 feet long, weighing 3500 tons, approximately one ton per linear foot. The cable will be formed of 61 strands of 306 wire each, a total of 37,332 individual wires. In fashioning each strand of 306 wires, little difficulty is experienced. In winding the 61 strands into the cable the workmen face a gigantic task. A large hydraulic press with a pressure of 30 tons is required in this operation. Fifteen tons pressure is needed to compress the cable five inches, and 15 more tons of pressure is required to reduce the cable another ½-inch. The suspender ropes also are being manufactured at the Monessen plant. These total 596 and will weigh 400 tons.

Conference Board's Work Is Broadened

New York, Dec. 9.—Because of the growth of industry and its increased economic importance since the war, the work of the National Industrial Conference board has been greatly expanded. Its research reports are used not only in the United States but in foreign countries. Among these reports are surveys covering the cost of living, wages, hours of employment, the economic significance and legal status of trade associations, workmen's compensation, taxation and governmental expenditure.

As a result of the broadening out of the work of the National Industrial Conference board, the latter has been incorporated under the laws of New York state, with Magnus W. Alexander as president. Mr. Alexander has been managing director of the board since its organization in 1916, prior to which time he had long been associated with the General Electric Co. The headquarters of the board are 247 Park avenue, New York City. Frederick P. Fish remains chairman of the board; Loyall A. Osborne and John W. O'Leary are vice chairman; Fred I. Kent is treasurer and Charles Cheney is chairman of the executive committee.

Americans Buy Iron in Britain

Market Is More Active, Continental Consumers Inquiring—Tin Plate Demand Dull, Output May Be Restricted—French and Belgian Steel Prices Easier—Some Sales Made to United States

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Dec. 9.—More activity is apparent in the British pig iron market, purchases being made by interests in the United States and Denmark. Inquiries also are coming from users on the Continent. The city of Newcastle has placed a contract for a bridge, to cost £500,000, with Dorman, Long & Co. Singapore has ordered 18 miles of steel pipe. An order for two of the largest British-made locomotives has been placed with a builder in Manchester for use in Bengal.

The market for tin plate is dull, and makers are considering restricting production. Exports of galvanized sheets are satisfactory. Exports of iron and steel products from the port of Middlesbrough during November totaled 92,524 tons. This is one of the best reports issued in several months.

IRON TRADE REVIEW'S report from Paris states that billets have been sold at £6 ($28.26) delivered in England. The market is active; steel prices generally are easier. Brussels also reports easier prices prevailing in the Belgian market. Some steel is being sold to the United States. Berlin reports Scandinavia is buying rods at £6 17s ($32.27). German exports are fair.

British Market Continues Improved Tone

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng. Nov. 29.—The British iron market continues to show a confident tone, a remarkable feature, however, being that while prices are increasing in America and on the Continent they remain steady and practically unchanged throughout British districts. The improvement is now influencing production. Two furnaces have been started in the Barrow area, bringing the number to 13, and stocks in all districts are rapidly disappearing. Cleveland is preparing to restart a furnace for the production of ferromanganese. At least two furnaces are being got ready in Lincoln, and there is a possibility of increased production in the Midlands.

The coke situation is of decided assistance to pig iron. A meeting has been held at Sheffield of cokemen and furnacemen to reconsider prices. Pig iron producers have been pressing for reductions, and at this conference urged the cokemakers to make a cut below the 16s 9d ($3.87) minimum. This, however, they decline to do and the meeting terminated without agreement. Fuel continues plentiful, and smelters are fairly confident that easier prices will be obtainable. This will enable furnacemen to quote moderate figures and thus assist all branches of the iron and steel trades in competition.

Cleveland No. 3 remains at £4 2s ($18.52) Northampton £3 17s 6d ($17.94) and Derbyshire at £4 2s 6d ($19.09). While there is much greater firmness in West Coast iron higher prices are not named. Cleveland sales show an expanding export business, America being in the market for foundry iron and Germany being among the Continental customers. Stocks of hematite are rather heavy in that area but they are moving at a satisfactory rate.

British steel prices show practically

Sterling—$4.63

no change. For joists, sections, etc £9 2s 6d ($42.24) is quoted delivered, but £9 ($41.67) would not be refused where the order carries a specification. Among constructional work is an Australian contract with Armstrong Witworth & Co., to provide steel work for the proposed bridge over the George river in New South Wales.

Belgian billets at £6 15s ($31.24) are not formidable competitiors with British material at £7 10s ($34.72). But it is still possible to buy finished steel at Antwerp at £6 7s 6d ($29.51) f.o.b. and British merchants are importing some of this material.

The most remarkable anomaly is a falling off in the Welsh tin plate trade which has practically enjoyed a boom of full production for the last two years. Now that other departments have recovered nearly 2000 men have been thrown idle and a number of works have gone on short time, compelling something like 8000 hands to reduce their earnings. The matter is of importance to Welsh steelworks, where the demand for sheet and tin bars is one of the most dependable lines. Up to the present the tin plate mills have been able to maintain the standard of £1 3s 6d ($5.44) Her tin plate bars have been reduced to £8 7s 6d ($38.77) less 7s 6d rebate ($1.73) to tin plate mills. A few continental inquiries are in the market, but there are now considerable stocks and early recovery is not expected.

The position in galvanized sheets contrasts with that of tin plate, a decided recovery being manifest. India Australia and South Africa have been placing good orders and there is now no difficulty in maintaining the £17 10s ($81.02) figure. Galvanized sheets are a feature in Middlesbrough, and sheets of all descriptions, especially galvanized and light gages are called for in the Glasgow export market. Several of these orders are for February and March delivery; the rise of sheet prices on the Continent appears to have diverted considerable tonnages to the British works. The motor trade is extending its season much over the usual period, being still a good customer various classes of sheets.

Demand is improved for steel scrap lifting prices by about 2s 6d ($0.57) per ton, and dealers could dispose of heavy tonnages if they cared to arrange forward bookings on present prices. But this they are indisposed to do having no doubt that the continued improvement must set up a larger demand for scrap steel, carrying with it a decided increase in values.

German Exports Lower; Imports Increase

Berlin, Nov. 29.—Germany's exports of iron and steel products were 135,546 metric tons in September compared with 146,491 tons in August, 116,529 tons in July and 118,406 tons in January 1924. This represents a decrease of 10,945 tons from the preceding month but 19,017 tons more than July. Among the principal items exported in September were 34,053 tons of scrap, 16,037 tons of plates and sheets, 13,405 tons of bars and bands, and 12,560 tons of rolled and drawn wire. Only 1560 tons of pig iron were exported in September.

German imports in September were 45,169 metric tons compared with 42,591 tons in August, 104,098 tons in July, and 104,569 tons in January 1924. September is 3578 tons above August, which was the lowest in three years. Among the principal items imported in August were 13,283 tons of bars and bands, 9737 tons of rails and track fastenings and 8128 tons of pig iron.

Current Iron and Steel Prices of Europe

Prices Converted into Dollars at Rates of Exchange, December 8

	British Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgian and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Ports	
Export Prices f. o. b. Ship at Port of Despatch—By Cable	£ s d			Francs		Francs	£ s d	
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$19.11	4 2 0*	$18.17	335	$18.60	375	$21.20	4 10 0
Basic	18.84	4 0 0	18.45	340	18.35	370	23.55	5 0 0
Basic-bessemer	21.20	4 10 0†	17.63	325	17.36	350	21 20	4 10 0
Hematite, Phosphorus 0.02-0.05	20.96	4 9 0	22.79	420	.....	...	27.08	5 15 0
SEMIFINISHED STEEL								
Billets	$30.62	6 10 0	$25.77	475	$26.29	530	$24.73	5 5 0
Wire rods	51.81	11 0 0	32.55	600	31.99	645	32.26	6 17 0
FINISHED STEEL								
Standard rails	$41.21	8 15 0	$27.67	510	$30.26	610	$30 62	6 10 0
Merchant bars	1.79c	8 10 0	1.28c	520	1.26c	560	1.28c	6 0 0
Structural shapes	1.68c	8 0 0	1.23c	500	1.22c	540	1.25c	5 17 0
Plates, ship, bridge and tank	1.84c	8 15 0	1.71c	695	1.49c	660	1.55c	7 5 0
Sheets, black, 24 gage	2.63c	12 10 0	2.58c	1,050	2.93c	1,300	2.62c	12 5 0
Sheets, galvanized, 24 gage, corrugated	3.68c	17 10 0	4.23c	1,745	5.06c	2,250	4.91c	23 0 0
Bands and strips	2 31c	11 0 0	1.73c	705	1.74c	775	1.92c	9 0 0
Plain wire, base	2.42c	11 10 0	2.26c	920	1.91c	850	1.94c	9 2 0
Galvanized wire, base	3.15c	15 0 0	3.00c	1,220	2.48c	1,100	2.24c	10 10 0
Wire nails, base	3.05c	14 10 0	2.46c	1,000	1.91c	850	2.35c	11 0 0
Tin plate, base box 108 pounds	$ 5.53	1 3 6	.....	....	.....	....	$ 6.59	1 8 0
Domestic Prices at Works or Furnace—Last Reported								Renten Marks
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$19.11	4 2 0	$16.82	310(2)	$18.60	375	$20 24	88
Basic pig iron	18 84	4 0 0	16.82	310(1)	18.35	370	22.54	98
Furnace coke	4.00	0 17 0	8 14	150	7.19	145	5.52	24
Billets	31.79	6 15 0	24.14	445	26.04	525	25.76	112
Standard rails	1.79c	8 10 0	1.16c	470	1.37c	610	1.41c	135
Merchant bars	1.84c	8 15 0	1.30c	530	1.31c	580	1.27c	122
Shapes	1.79c	8 10 0	1.23c	500	1.23c	575	1.22c	117
Plates, ship, bridge and tank	1.95c	9 5 0	1.75c	710	1.53c	680	1.43c	137
Sheets, black, 24 gage	2 73c	13 0 0	2.95c	1,200	2.93c	1,300	2.35c	225
Sheets, galvanized 24 gage, corrugated	3 68c	17 10 0	4.11c	1,670	5.23c	2,325	4.64c	445
Plain wire	2.42c	11 10 0	2.30c	935	1.91c	850	1.67c	160
Bands and Strips	2.42c	11 10 0	1.65c	670	1.86c	825	1.67c	160

* Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 17s 0d ($4 00) f. o. b. Ferromanganese, £13 10s 0d ($62.64) f. o. b. The equivalent prices in American currency are in dollars per ton for pig iron, coke semifinished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

American Loan Helps French Business

European Staff Special

Office of IRON TRADE REVIEW,
23 Rue de la Bienfaisance

Franc—$0.055

PARIS, Nov. 28.—The decision of American bankers to loan France another $100,000,000 has given a fresh impetus to business. The French consider the Americans shrewd business men and the fact that the latter have confidence in the stability of French finances has spurred French investors to subscribe to the internal loan which has been given much publicity and is reported to be going well. The iron and steel market has benefited by the optimism which now prevails. The buying movement which started early in November has extended rapidly and prices have stiffened.

Demand for pig iron is brisk. Export business with England, Holland and Italy is increasing. Shipments of pig iron to foreign destinations during October exceeded September by 5000 tons. Phosphorus pig, 2.50 to 3.00 per cent silicon, is offered for export at 325 francs ($17.87) per metric ton f.o.b. Antwerp. Domestic orders for this quality are being booked at 300 francs ($16.50) f.o.b. furnace. Hematite pig ranges from 410 francs ($22.55) to 420 francs ($23.10) f.o.b. furnace. Considerable tonnage has been booked for export to Italy at 420 francs ($23.10) f.o.b. cars Modane, which is the French-Italian frontier station.

Shipments of semifinished steel to Germany continue. All tonnage for this destination must be shipped before Jan. 10 as the new German tariffs on metallurgical products become effective then. England is also buying French blooms and billets. Basic bessemer blooms are quoted at 420 francs ($23.10) and billets are firm at 450 francs ($24.75) both per metric ton f.o.b. mills. Open-hearth steel brings an extra of five francs ($0.27) over bessemer.

Bids have been opened on 10,000 tons of rails required by the French State Railways. The Acieries de Longwy was awarded an order for 5000 tons of 46-kilo standard type at 457 francs ($25.13) per metric ton f.o.b. cars Mont-Saint-Martin. Another order for 5000 tons of Vignole type went to La Providence who quoted 469.75 francs ($25.85) f.o.b. cars seller's works, Rehon. These prices are about 50 francs ($2.75) per metric ton under prices prevailing one year ago. An order for 3000 tons of steel cross ties went to the Acieries de Micheville at 475 francs ($26.12) per metric ton f.o.b. cars Villerupt and a second order for a like quantity was awarded the Acieries de Rombas at 499.50 ($27.50) f.o.b. cars Grandrange.

Merchant bars have moved up to 520 francs ($28.60) which is an advance of 20 francs ($1.10) over last week's quotations. Hoops and wire rods remain unchanged. French makers of structural shapes are encountering keen competition from Belgium, Luxemburg and the Saar. Prices on large sections range from 500 francs ($27.50) to 520 francs ($28.50) per metric ton f.o.b. mill. Promises of shipment on new business average 10 to 12 weeks for merchant bars; eight weeks for semifinished steel products; six weeks for structural shapes and three weeks for wire rods.

Seeks New Stock Issue

The petition of the H. C. S. Cab Mfg. Co., successor to the H. C. S. Motor Car Co., Indianapolis, for permission to sell $100,000 of common stock is being considered by the Indiana securities commission. The company is leasing the building and real estate of the present plant from the Capitol Avenue Realty Co. The reorganized company makes only taxicabs.

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Each Man Has 30 Slaves

SELDOM does the head of a large trade or technical association present in his retiring message as much useful information, as accurate an analysis of the present and as intelligent a survey of the future as are found in the presidential address of Fred R. Low, which was delivered last week before the American Society of Mechanical Engineers. Even if its substance were not unusual, it would command attention by virtue of the relief it affords from the monotony of conventional annual addresses, which in the case of many societies are devoted to a perfunctory rehearsal of the activities of the organization during the incumbency of the speaker.

Mr. Low views the power situation of the United States from a broad perspective. He estimates the installed capacity of prime movers in central stations and industrial plants as 45,000,000; electric railways 4,119,000, mining 5,147,000; stationary (nonindustrial) 4,000,000; steam railroads 130,000,000; navigation 5,000,000; agricultural and traction, 200,000,000 and automotive 300,000,000 horsepower. This gives a total in round numbers of 700,000,000 horsepower, which, declares Mr. Low, is equivalent to the "ability to produce for each man, woman and child of our population if they demanded it, physical service equal to that which could be rendered by thirty-odd slaves."

The country is mainly dependent upon its fuel supply, unless and until, Mr. Low qualifies, "some other source is discovered." Then follows a most interesting series of examples of the force exerted by nature, the secrets of which thus far have baffled man.

"In order to separate carbon and oxygen in the laboratory," said Mr. Low, "we are obliged to use powerful chemical agents and to conduct the process in vessels composed of the most refractory materials; but in the economy of nature this process is constantly going on, not with the noisy demonstration of prodigious effort, but quietly, in the delicate structure of a green leaf waving in the sunlight. When we shall have found the secret of the vegetable cell, there may be a possibility of accelerating and intensifying this slow process of nature and of utilizing more directly a large proportion of the stream of energy from the sun."

In conclusion the author points to the progress made in increasing the efficiency of generating power from coal and declares that for the moment the line of development should be to make the best use of existing fuel sources.

But even while urging this practical step he predicts the time is not inconceivable when "these present tools of power generation will be as archaic as the turbine of Hero and the engine of Papin."

Workers in all fields of industry can profit from this advice, which in effect is to continue to develop the tools and equipment at hand, meanwhile maintaining a receptive attitude toward new ideas. With this balance between the ideal and the practical steadily maintained, industrial progress is assured.

Waterways Dictate Steel Competition

SINCE the elimination of Pittsburgh plus in the pricing of sheets, wire and pipe as well as plates, shapes and bars, it has been said frequently that the future of the Chicago district rests with the development of water transportation. To the South and West lie the potential markets to be reached by way of the Gulf-to-Lakes waterway and to the East and abroad those to be tapped by the St. Lawrence seaway.

Probably few are aware that only a 65-mile gap between Lockport, the southern terminus of the Chicago sanitary canal, and Utica, on the Illinois river, remains to be opened to permit the barging of steel, in cargoes up to 9000 tons, to the South and West. There is every reason to believe that this gap will have been removed in about four years. And what are the possibilities?

Chicago will be 400 miles nearer New Orleans than Pittsburgh. There will be only five locks between Chicago and New Orleans, compared with 52 between Pittsburgh and New Orleans. Certainly steel will be barged to the southern and western markets in quicker time from Chicago than from Pittsburgh and presumably the rates will be lower.

Chicago once more may be able to compete actively

for West Coast business. The advantage to Pittsburgh and Lorain in all-rail shipments of pipe to the southwestern oil fields resulting from the present rate structure, which is peculiarly distressing to western makers, will be surmounted. The effect on export business to South America and the Orient may be conjectured.

Of course, there is another side to the picture. Some market observers believe that development of this water route into the Chicago district will open the way for severe competition from the Birmingham district by way of the Warrior river. Then St. Louis with its advantages of location appears as a strong potential contender of the future for midwestern and southwestern trade. Already some Belgian steel has found its way up the Mississippi and Missouri rivers and European steel could be brought to the door of the Chicago district. The St. Lawrence seaway, which would permit direct foreign shipments from Chicago, would present equal competitive opportunity for foreign makers.

Certainly the contemplation of these projects, of which the Gulf-to-Lakes is near consummation, opens wide vistas and they may revolutionize the present distribution of steel from the Chicago and Pittsburgh districts as well as bear greatly upon the West Coast and foreign business of the eastern mills.

Iron Ore Industry Due for Prosperity

SINCE 1918 the Lake Superior iron ore industry seems to have adopted the rythmic cycle theory of business, and to have put it into practice. For the last seven years we have had recurring periods of peaks and depressions, at almost regular intervals. The close of the shipping season of 1924 marks one more downward swing of the pendulum. A reverse movement to another high point may be expected for 1925, not only in accordance with the tendency as indicated during the past seven years, but based on all factors in the trade.

In 1918 shipments totaled 62,836,172 tons. In the following year they dropped to 48,546,651 tons. Now note that in 1920 they ascended to 60,411,572 tons. The next year brought another precipitate reduction, to 22,798,349 tons. The recovery in 1922 was not so pronounced, the tonnage totaling 43,990,096. This, of course, did not represent a normal volume and it was exceeded in 1923 with a shipment of 60,780,003. Then 1924 came with a descent to 43,723,572 tons. The more these figures are compared and studied in relation to consumption the more positive it appears that next year's business will be approximately normal. The indications are so strong that some of the leading observes believe the shipment will exceed 60,000,000 tons.

Furnace interests have been buying ore "close in" and have kept their supplies low. The tonnage on lower lake docks and at furnaces at the start of navigation in the spring will be below normal. In the meantime ore producers sharply curtailed their output. The industry as a whole was operating in 1924 at less than 50 per cent of capacity. Such shipments as were made reduced stockpiles.

The year 1925 presents a promising picture from the viewpoint of operations and shipments. By reducing prices 80 cents last year, the industry contributed substantially to the general "shaking down" process, and now with the improvement in conditions, and better prices for pig iron and steel commodities, the Lake Superior iron ore producer expects confidently to share in the prosperity.

Co-operation Our Foreign Policy

DECLARATION by President Coolidge at Chicago "that we cannot hope to maintain indefinitely our country as a specially favored community, an idle contentment lifted above the general level of the average of humanity" is taken to mean that the President now proposes a degree of international cooperation which would be a step more advanced than the views of the irreconcilables of 1920 and 1921 on foreign relations. It is not assumed by any means that President Coolidge has changed his attitude in regard to American relations with the League of Nations, but it is apparent from his recent utterances that he is leaning more decisively toward the Hughes than toward the irreconcilable position.

The late President Harding was not an isolationist, even going so far as to propose an association of nations, but this idea never was evolved in his administration beyond the embryonic stage. Word comes from Europe that the United States naturally must have a clear, technical interest in reparations payments, which, in their ultimate effect, must react on business generally. The business world of Europe continues its upward trend while the reparations question is developing toward solution, with setbacks only here and there. The conservative tendency of the recent elections in England and the United States has generated an atmosphere of cofidence which has bestirred business in the United States and in Europe.

Through the International Chamber of Commerce it is reported that while British steel interests are watching German developments with some apprehension under the impetus given by the Dawes plan, the general trend is encouraging.

The United States has vital interests in European recovery. Technically, it has claim for the cost of the army of occupation and for the claims now being adjusted by the mixed claims commission. The Dawes plan has definitely modified the treaty of Versailles. The business world is interested keenly in the coming meeting of the finance ministers of the countries interested in deciding upon how the proceeds issuing from Germany under the Dawes plan shall be divided among the creditor nations.

Senator Borah, of Idaho, now has become head of

the powerful foreign relations committee in the senate. He is disposed to work with the President. While an antileaguer he is by no means in favor of isolation policies on the part of the American government. It is believed the government more than ever now is in a position to strike out with greater firmness in matters of legitimate foreign concern.

Yesterdays in Industry

Trade and Technical News from IRON TRADE REVIEW 10, 20 and 30 Years Ago

December 6, 1894

PROGRESS can't be clearly visualized under a span of 10 *years. LaBelle Iron Works, Wheeling, manufacturer of muck bar and steel cut nails, has decided to engage in the manufacture of tin and terne plate and is building a* 44*-mill plant, to be ready by April* 1, 1895. *The position of LaBelle* 10 *years later is shown under the* 1904 *news.*

* * *

Iron ore shipments of 7,776,547 tons by lake exceeded expectations. Ashland displaced Escanaba in tonnage shipped with Marquette third and Two Harbors and Duluth close for fourth place, the former leading by two cargoes. Of this total 6,350,825 tons came to Lake Erie ports and the remainder of 1,425,722 tons went to South Chicago, Milwaukee and a few charcoal furnaces.

* * *

Ore receipts at Lake Erie ports were in the following order: Ashtabula, Cleveland, Fairport, Erie, Buffalo, Conneaut. Cleveland made a decided gain on Ashtabula during the year.

* * *

Jeremiah Head of Middlesbrough, England, on his return from a trip in the United States addressed the Cleveland Institute of Engineers. He told the progress being made in the use of basic open hearth for steel production. The cost of the process is 2s 6d more than the bessemer process but the lower cost of the pig iron more than makes this up. Alabama produced the cheapest pig iron in the world, he said, 6s to 7s cheaper than Cleveland iron, but it had not then been tried for steelmaking. He said the basic process, using higher phosphorus pig iron offered the means of bringing prosperity to the United Kingdom.

* * *

December 8, 1904

HOPE springs eternal and mighty projects that seem enough to cover all possible contingencies fail to meet needs that arise later. The Pennsylvania railroad at Pittsburgh was completing a terminal with 350 *miles of trackage, to accommodate* 40,000 *cars and to cost* $21,000,000. *The war and government operation not then being imagined,* IRON TRADE REVIEW *says, "it is believed that any freight congestion such as handicapped the iron and steel industries two years ago can be entirely prevented so far as this road is concerned."*

* * *

LaBelle Iron Works, Steubenville, had awarded the contract for an 84-inch plate mill to roll wide skelp also. This company then had two blast furnaces.

* * *

The iron molders union of North America voted to increase the proportion of apprentices to journeymen from 1 to 8 journeymen to 1 to 5. The former proportion had continued many years and previously had been 1 to 10.

* * *

Labor agitators, then as now, had their troubles. Theodore J. Shaffer, president of the Amalgamated association, announced definitely he would not run for the office again. A number of efforts to depose him had failed. During his administration several strikes were lost and the association also had lost a number of important shops.

* * *

Ore railroads owned by the United States Steel Corp. paid 150 per cent dividends, mostly to the corporation, totaling about $8,000,000. The Duluth & Iron Range railroad had paid three dividends in 20 years, all liberal.

* * *

December 10, 1914

IRON ore shipments from Lake Superior ranges were 32,021,897 *tons, compared with* 49,170,478 *in* 1913, *a decrease of* 17,048,581 *tons.*

* * *

Dr. John Edson Sweet, Syracuse, N. Y., was presented the John Fritz medal for 1914 at the meeting of the American Society of Mechanical Engineers. John A. Brashear, Pittsburgh, was elected president of the society and Robert W. Hunt of Chicago read a paper on eliminating seams from steel rails. All three of these leaders have passed away since that time. F. K. Vial of the Griffin Wheel Co., Chicago, read a paper on crane wheels. He still is active in his company.

* * *

Some Prices from the Past

	Dec. 6, 1894	Dec. 8, 1904	Dec. 10, 1914
Basic, Pittsburgh	....	16.10	13.45
Bessemer, Pittsburgh	10.65	16.35	14.70
No. 2 foundry, Pittsburgh	10.25	16.85	13.70
No. 2, foundry, Chicago	10.00	16.25	13.00
Lake Superior, Chicago	13.00	17.00	15.75
No. 2 southern, Birmingham	....	13.75	9.75
Bars, steel, Pittsburgh	....	1.35c	1.05c
Bars, steel, Chicago	1.25c	1.465c	1.25c
Plates, Pittsburgh	1.15c	1.40c	1.05c
Shapes, Pittsburgh	1.25c	1.40c	1.05c
Heavy melting steel, Pittsburgh	....	14.75	10.25
Heavy melting steel, Chicago	7.00	13.50	8.00

Apprenticeship Plan Needed

To the Editor:

I am puzzled at the apparent apathy of manufacturers on the subject of training apprentices for the metalworking trades. From my own observation, this indifference seems to be more pronounced in the eastern states than in the Middle West where the success of the Milwaukee apprentice system perhaps is better known.

Yesterday a meeting was held in New York on training for the industries and although several speakers discussed various phases of the problems of apprenticeship, there was no appreciable response from the several hundred engineers and employers present. Can it be that manufacturers do not foresee the need of training boys to fill the rapidly thinning ranks of skilled workmen?

What is needed is a realization among employers of their obligation to themselves individually and to industry as a whole to set up a plan whereby a steady stream of expert foundry and machine shop workers will flow from apprentice schools in industrial plants. Until this need is met, a comparatively few companies will continue to serve as the "training schools" for the benefit of their less conscientious competitors.

NEW ENGLAND MANUFACTURER.

Boston, Dec. 4, 1924.

See Large Saving

Commission Report Presents Reasons For Expectation

Washington, Dec. 9.—Cost to the government and taxpayers of the prosecution of the Pittsburgh basing point case against the United States Steel Corp. and subsidiaries amounted to $88,945.33, it is shown in the annual report of the federal trade commission, which devotes considerable space to a review of the proceedings.

Reduced cost of steel to consumers is seen as a probable result of the cease-and-desist order abolishing the Pittsburgh basing point, if production costs in certain districts can be brought below the general cost level when Pittsburgh plus was in operation. Discussing the Pittsburgh plus case the report says:

"A compliance with the order of the commission should tend to decentralize the steel industry and to avoid the great amount of cross freights in shipping steel from one steel center into the territory of another, which has proved so costly to the public. It should also produce other effects beneficial to the public interest, among which may be mentioned:

"First, the sale of steel at low cost producing centers at prices commensurate with the cost of production. The reverse of this was the condition under the Pittsburgh plus system.

"Second, the placing of the competitors of the American Bridge Co. and other like subsidiaries of the Steel corporation who must buy their steel from others, more nearly on an equal basis with such subsidiaries.

"Third, the saving to western and southern steel users of the extra prices charged for steel under the Pittsburgh plus system.

"Fourth, the saving to the consuming public of much more than Pittsburgh plus, such as notably in the case of the farmers; in such case the Pittsburgh plus paid by the agricultural implement makers was reflected in the ultimate selling price of such implements to the farms by an increase of more than double the amount of Pittsburgh plus.

"Fifth, the material cutting down of the overhead expense of the western and southern steel users which had been occasioned by the extra prices paid by them for steel under the Pittsburgh plus system.

"Sixth, the use of waterways in shipping steel in order that eastern steel producers may enlarge their markets by cheaper transportation. Under the Pittsburgh plus system the Pittsburgh district steel producers were not interested in cutting down transportation charges from Pittsburgh which would have enabled them to effect a saving to the public.

"Seventh, the enlargement of the territory in which the western and southern steel users can compete with their Pittsburgh district competitors, a territory which had been unnaturally and materially restricted under the Pittsburgh plus system.

"Eighth, the natural growth of steel-producing centers at points of low cost production and increasing demand. Under the Pittsburgh plus system the growth of the Pittsburgh district steel center had been continuously, unnaturally, and materially encouraged, while that of the western and southern steel centers had been likewise discouraged.

"Ninth, a compliance with the commission's order, while not of itself a preventive of restraint in price competition, should measurably encourage such competition. At the same time it should have the effect of eliminating the burdensome discriminations in steel prices which existed under the Pittsburgh plus system."

To Enlarge Pipe Works

Birmingham, Dec. 8.—Important enlargements of the plant of the McWane Cast Iron Pipe Co., Birmingham, are planned according to official announcement. A new machine shop, extension of the foundry and a new sand storage warehouse are among the extensions now started. The machine shop will have more than twice the capacity of the present shop. The building will be of fireproof construction, steel frame with metal sash and designed for maximum light and ventilation. All the machinery and equipment in the present shop will be transferred to the new one and additional machinery installed. With the completion of the new machine shop, space now occupied in the foundry building will be utilized for increased molding capacity for cast iron pipe and fittings.

May Increase Capital

Stockholders of the Penn Seaboard Steel Corp., Philadelphia, will meet Dec. 12 to act on a proposed plan to increase the company's capital from 1,500,000 to 3,000,000 shares of no par stock. The company expects to use the funds from the proposed sale of 1,500,000 shares of new stock to complete the plant at Newcastle, Pa., install two large open-hearth furnaces and build a strip mill, as well as strengthen working capital. J. B. Warren, president, points out that the company has no funded debt and that the floating debt has been reduced $2,000,000. The proposed improvements will cost about $850,000.

Ludlum Net Declines

The Ludlum Steel Co., Watervliet, N. Y., reports consolidated net income for the three months ended Sept. 30, 1924, of $15,576 after depreciation, interest and federal taxes. This compares with $61,456, earned in the previous quarter and $90,131, in the March quarter of this year. For the first nine months of 1924 net income totaled $167,163.

Speakers at the December meeting of the Rockford Engineering society, Rockford, Ill., declared that the difficulty of finding trained men, brought about by the rapid growth of the machine tool industry, is a handicap.

Safety Division

In Labor Bureau Recommended by Secretary Davis

Washington, Dec. 9.—In his annual report to congress, Secretary of Labor Davis urges a "following up" of the industrial accident prevention work which was the subject of a meeting called here in December last year. Owing to a lack of funds for the department it has not been possible to accomplish anything further in this line.

"State contracts have been made in a number of instances," says the secretary, "but owing to the fact that I have but one man to handle this entire program the progress is entirely unsatisfactory. The fact that the industrial accidents causing a loss of wages for one day or more in 1923 practically were 2,500,000, of which 23,000 were fatal, should be sufficient emphasis upon the importance of this work, and the department should be put in a position to employ several experts to place the machinery of accident prevention in operation as rapidly as possible."

Secretary Davis recommends that a division of labor safety be created in the bureau of labor statistics and that funds be provided. Such a division would bring into uniformity state legislation along accident prevention lines and uniformity in the gathering of accident statistics, according to the secretary's views. The most reliable data on accidents of any industries in the United States are that for the iron and steel industry, mining and the railroads. Aside from these, no complete and trustworthy industrial accident statistics exist.

The report states that the immigration from the nonquota countries of Canada and Mexico has been heavy since the enactment of the 2 per cent law. With these avenues open for nonquota immigrants, the territory adjacent to the United States becomes a mecca for the "bootlegging" of aliens from the quota countries in Europe and elsewhere, it is pointed out.

Among other recommendations of the secretary are the following:

Placing immigrants from Canada, Mexico, Central and South America under quota restrictions instead of granting them nonquota entry.

Elimination requirements of passports from a foreign government for immigrants.

Admission of farmers and skilled or unskilled labor where labor of like kind cannot be found unemployed in the United States, provided that strikes or lockouts do not exist in the industries where such immigration is sought.

Authorization of the President to order immigration suspended upon joint certification of the secretary of labor and the secretary of commerce, that unemployment in the United States justifies it.

Beehive Output Holding Even Pace

The production of beehive coke was almost exactly the same in the week ended Nov. 29 as in the preceding week, says the geological survey. The total output as estimated from reports on the number of cars of coke loaded is placed at 158,000 net tons, a figure identical with that of the preceding week. Actually there probably was a decrease of a few hundred tons. A decrease of about 1000 tons in Pennsylvania and Ohio was offset by a corresponding increase in the group of four southern states. The record of output by districts follows:

	Week ended		
	Nov. 29, 1924a	Nov. 22, 1924	Dec. 1, 1923
Pennsylvania & Ohio..	115,000	116,000	196,000
West Virginia	8,000	8,000	13,000
Alabama, Kentucky, Tennessee & Georgia	19,000	18,000	16,000
Virginia	8,000	8,000	10,000
Colorado & New Mexico	4,000	4,000	6,000
Washington & Utah ..	4,000	4,000	4,000
United States total ...	158,000	158,000	245,000
Daily average	26,000	26,000	41,000

(a) Subject to revision. (b) Less one day's production in the number of days covered for the two years.

The effect of the Thanksgiving day holiday is reflected in the decline of bituminous coal production to 9,646,000 tons in the week ended Nov. 29 compared with 10,559,000 in the preceding week.

Hydraulic Steel May Have Receivership Lifted

A reorganization of the Hydraulic Steel Co., Cleveland, and the lifting of the receivership as soon as possible is recommended by Thomas P. Goodbody, receiver, in a report covering operations from Oct. 27, 1923, to Oct. 31, 1924.

During this period the company accumulated net profit, before interest on investment of $281,390. Sales totaled $5,149,500 and operating profit $475,046. Allowance for depreciation was $160,544 and the cost of special tools $33,110. The deficit for the period was $3,547,979. The receiver now is discounting all bills. Under the management of the receiver the character of the business has changed to a large extent from the manufacture of automobile frames, brake drums and axle housings to washing machine stampings, conveyor rolls and commercial stampings. Recently the production of pressed steel parts for refrigerator cars was begun.

Car Profits Less

The Canadian Car & Foundry Co., Ltd., for the year ended Sept. 30, 1924, reports net profit of $1,124,221 after depreciation, federal taxes and interest. This compares with $1,427,573 in the previous year. Profit and loss surplus amounted to $3,993,869 against $3,567,148 in the preceding year.

Wickwire Reports Loss

The Wickwire Spencer Steel Corp., Worcester, Mass., reports a net loss for the three months ended Sept. 30, 1924, of $249,989, after interest, depreciation and other charges. This compares with an operating profit of $351,474 in the corresponding quarter of last year, before deduction of bond interest and depreciation. Sales for the third quarter of 1924 totaled $3,830,164 against $5,637,845 in the third quarter of 1923.

Places Boat Contract

The Bradley Transportation Co., controlled by the Michigan Limestone & Chemical Co., which is a subsidiary of the United States Steel Corp., has placed a contract for a 12,000-ton vessel to be equipped with the latest improvements for the rapid loading and unloading of limestone as announced in IRON TRADE REVIEW of Dec. 4. The vessel will serve various blast furnace plants of the United States Steel Corp. For building the boat, 5200 tons of steel will be required and this will be furnished by the Carnegie Steel Co.

Index to Business Trend Charts

THIS ISSUE

Subject	Page
Blast Furnace Index	1562
Pig Iron Situation	1562
Commercial Failures	1563
Freight Car Movement	1563
Employment Index	1564
Index of Basic Production	1564

REFERENCES

Corn and Wheat Prices	Dec. 4
Farmer Purchasing Power	Dec. 4
Foreign Exchange	Dec. 4
Foundry Pig Iron	Dec. 4
Gold Movements	Dec. 4
Wholesale and Retail Prices	Dec. 4
Automotive Production	Nov. 27
Business Index	Nov. 27
Foreign Trade	Nov. 27
Independent Sheet Situation	Nov. 27
Monthly Coke Output	Nov. 27
Structural Awards	Nov. 27
Bradstreet's Index	Nov. 20
Building Construction	Nov. 20
Monthly Ingot Production	Nov. 20
Security Prices	Nov. 20
Steel Orders	Nov. 20
Steel Price Index	Nov. 20
Car Orders	Nov. 13
Iron and Steel Price Parity	Nov. 13
Railroad Earnings	Nov. 13
Iron and Steel Foreign Trade	Nov. 6
Coal Index	Oct. 30
Wage Situation	Oct. 30
European Conditions	Oct. 23
Bonds and Interest	Oct. 9
Building Cost Index	Oct. 2
Merchant Pig Iron	Aug. 28
Bank Clearings	Aug. 7
Steel Castings Bookings	Aug. 7
Steel Wages and Prices	July 24
Electric Power Production	July 31
Mail Order Sales	May 8
Monthly Commodity Prices	March 13

Malleable Castings Sales Jump in October

Washington, Dec. 9.—Sales of malleable castings increased in October, as did production, shipments and capacity. Production jumped from 41,507 tons in September to 50,066 tons in October, the largest month since April when 58,634 tons was produced, according to the department of commerce. Shipments increased from 40,480 to 44,978 tons while bookings gained from 48,729 to 54,589 tons from September to October. Operations in October were at 43.8 per cent as compared with 36.9 in September. Following is a summary for the first 11 months of 1924:

	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
May	64,726	71	52,898	91,174
June	65,168	67.7	42,067	96,240
July	57,881	58.9	41,723	98,241
August	68,069	66.0	39,830	103,068
September ..	60,930	59.9	38,636	101,750
October ..	62,238	59.9	48,621	103,837
November ..	52,727	49.1	37,231	107,350
December ..	49,724	46.5	45,012	106,825
1924				
January ...	64,379	58.6	73,964	109,798
February ..	66,637	62.0	62,652	107,551
March	72,807	66.5	60,326	109,414
April	58,634*	53.7	45,955	109,131
May	49,814*	45.6	29,741	109,173
June	33,876*	31.2	22,880	108,520
July	31,159**	28.4	30,200	109,855
August	36,727**	32.6	34,627	112,496
September ..	41,507**	36.9	48,729	112,349
October	50,066***	43.8	54,589	114,264

*Includes 3 plants reported idle.
**Includes 4 plants reported idle.
***Includes 5 plants reported idle.

Locomotive Sales Drop

Washington, Dec. 9.—Unfilled orders of railroad locomotives on Dec. 1 totaled 397, 66 of which were for foreign account, according to reports on shipments and unfilled orders to the department of commerce from the principal manufacturing plants. This total of unfilled orders shows a drop of 65 locomotives from the total unfilled orders on Nov. 1, when the forward bookings numbered 462. On Oct. 1 the total was 386 engines.

November shipments of locomotives totaled 133, 10 of which were for foreign account. The total shipments compare with only 96 in October, and 104 in September.

Year and month	Shipments Total	Shipments Domes.	Unfilled orders Total	Unfilled orders Domes.
1920 monthly ave.	199	110	1,323	894
1921 monthly ave.	112	69	337	206
1922 monthly ave.	106	88	889	791
1923 monthly ave.	266	249	1,592	1,513
1924				
January	151	147	376	344
February	99	92	499	466
March	132	128	534	494
April	73	63	640	586
May	111	93	643	589
June	145	134	531	462
July	140	130	483	416
August	139	121	361	306
September	104	79	386	333
October	96	78	432	398
November	133	123	397	331

The Business Trend

December 11, 1924

BY JOHN W. HILL, FINANCIAL EDITOR

ONE of the most significant of recent developments has been the striking rise of commodity values. Next to the extraordinary stock market activity now unprecedented in the annals of the financial districts, the commodity price movement is of greatest interest

Two measures of the wholesale markets are available soon after the first of the month. One of them, Dun's index, shows a gain of 2¾ per cent in November and one of 9¾ per cent since June. The index is now the highest since January 1921. The other, Bradstreet's was up 1/3 per cent in November and 10 5/8 per cent from July.

No fluctuations of anything near the sharpness of these advances have occurred in a similar space of time since the violent decline of 1921. The present movement is refuting the views of those who have held that the day of rapid economic swings was passed.

It is also raising the question of whether or not threatened inflation has begun to appear. A sober analysis of the facts, however, does not indicate that such a condition yet is the case at least in any threatening sense.

Reasons for Advance

Prices have gone up for three reasons. These include the sweeping advance of foodstuffs due to the world crop shortage, the greater buying of raw materials from Europe, and the reviving demand for goods in the domestic market.

The factor of greatest weight has been the rise of grains. This has bolstered up the price average while industrial commodity prices were slumping. Good prices for farm products have restored the purchasing power of the farmer. This constitutes one element in stimulating demand for industrial goods. Speculation has helped put up farm prices, but the advances have been sustained by world conditions.

Some Prices Weak

Industrial goods have not soared. In fact some of them remain weak, and automobile companies have been cutting prices. Such advances as have occurred have been in response to healthy demand for commodities and not to overbuying or speculative excesses.

As a result it seems fair to say that inflation is not responsible for rising prices. Money remains easy but credit is far from being overextended. The present outlook is for still further advances in the general price level next year.

One development which may help to block inflation, if it does appear, is the outward movement of gold from the country. In one recent week $16,000,000 of gold were shipped to Europe. Nothing like this has happened in recent years. This reflects Europe's growing financial strength and may mean that this country's excessive gold resources are to be gradually drained off.

The Barometer of Business

Weekly Comparison

	Last week	Week before	One mo. ago	One year ago	1913
Business failures ..	399	311	332	461	...
Cash ratio Fed. Res. System %	75.1	77.4	78.2	76.4	...
Loan Rate, 4-6 mos. N. Y. %..	3¼-3½	3¼-3½	3¼-3½	5	5½
Aver. price 25 industrial shares ..	$126.14	$126.43	$120.63	$108.88	$58.19
Aver. price 25 railroad shares	$78.49	$77.58	$74.77	$58.25	$82.97
Av. price 40 bonds	$82.45	$81.98	$82.00	$76.60	$93.00
Car loadings week ended Nov. 22..	1,010,122	1,015,704	1,112,345	990,299	*889,138
Commercial loans, 7-4 3 member banks (000 omitted) *1920	$8,201,250	$8,216,652	$8,216,431	$7,945,033	.....

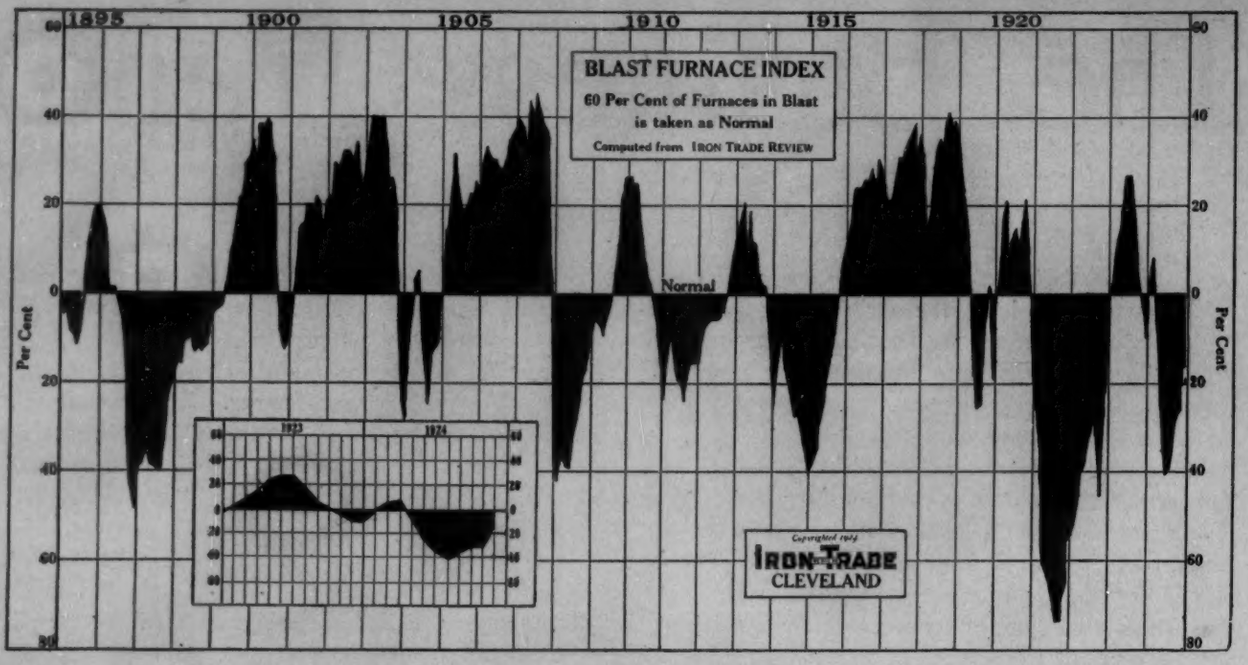
Foreign Exchange (Demand)

	Normal	Last week close	One week before	One month ago	One year ago
Sterling	$4.86	$4.68	$4.62	$4.59	$4.34
Francs	19.3c	5.43c	5.39c	5.24c	5.40c
Lira	19.3c	4.34c	4.34c	4.30c	4.34c
Marks	23.8c	23.8c	23.8c	23.8c	....

Monthly Comparison

	Oct.	One Month before	One Year ago	1913 Mo. average
Dodge Building awards in 27 states (sq. ft.)	47,489,800	43,452,700	54,936,000	31,250,000
Business failures:				
Number	1,696	1,306	1,673	1,336
Liabilities ..	$36,098,804	$34,296,276	$79,301,741	$22,732,000
Exports	$527,000,000	$427,635,576	$399,199,014	$233,195,000
Excess of gold imports	$15,576,274	$1,975,840	$28,488,128	†$630,716
Bureau of labor price index ..	151.9	148.9	153.1	100
Bradstreet's price index	*146.4	144.4	145.4	100
Economist's British price index	178.4	174	159	100
Nat'l Industrial Con. board living cost index	165	163.7	164.1	‡100
New incorporations	$543,490,000	$478,680,000	$651,577,000	$49,301,000
Railroad net earnings	$127,105,000	$116,000,000	$103,775,700	$59,301,000

†Excess of gold exports. ‡July, 1914. *November.

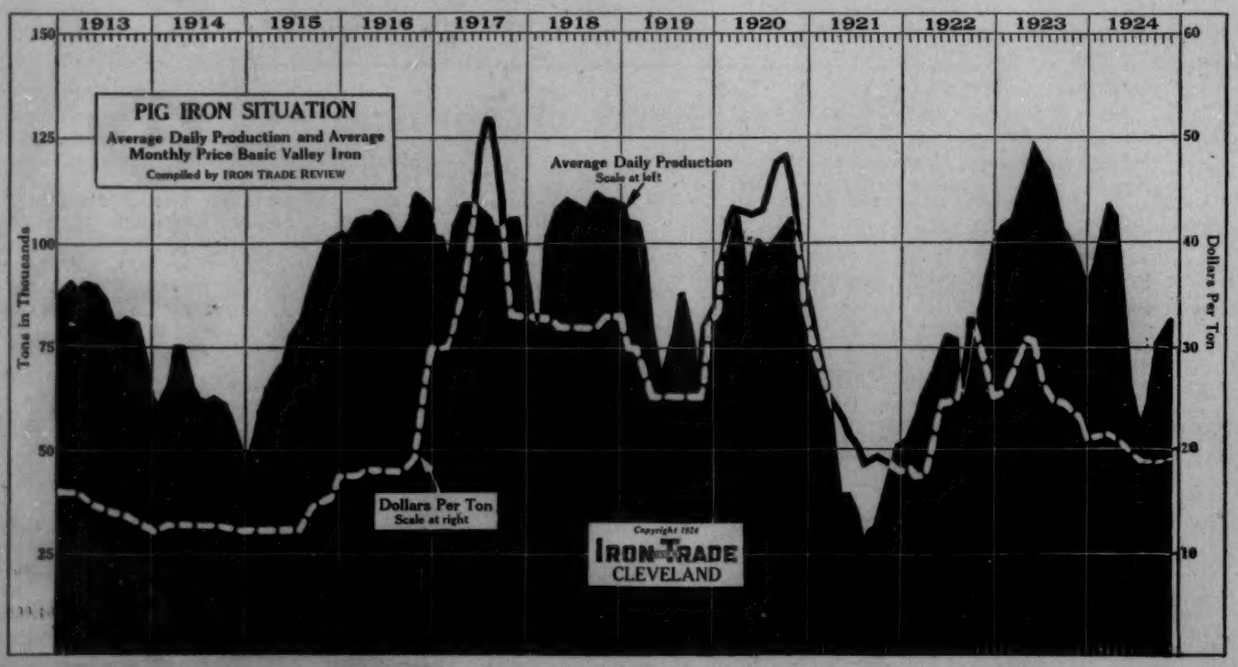


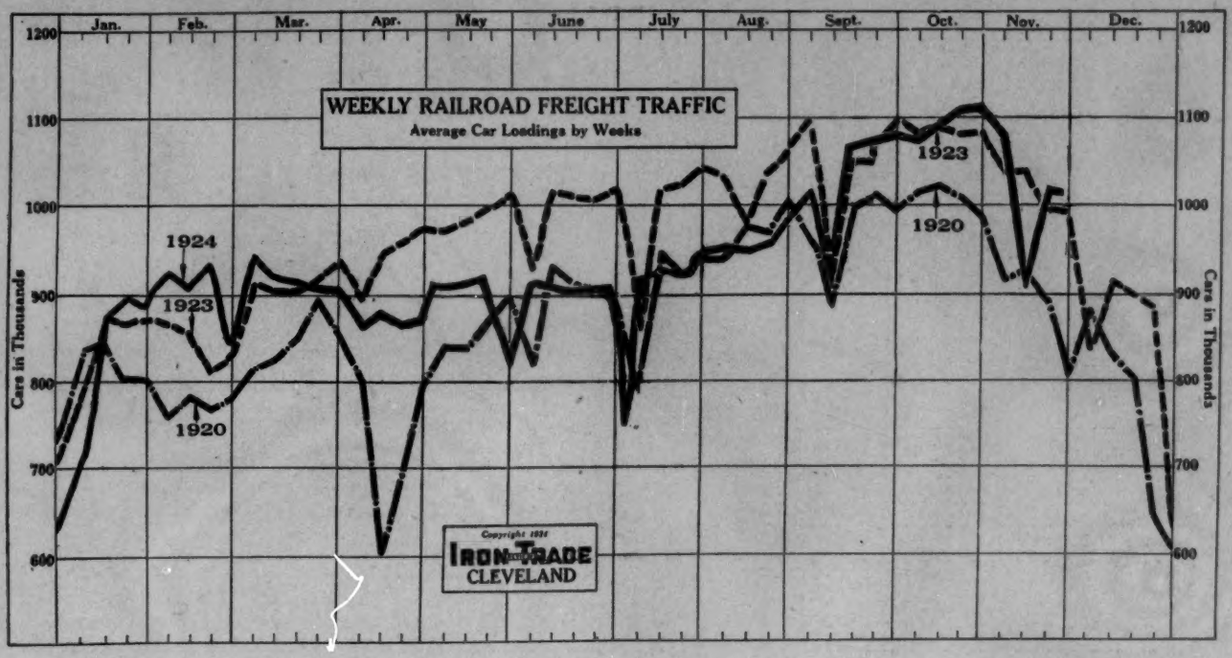
Blast Furnace Index

THE blast furnace index of general business devised by Col L. P. Ayres of the Cleveland Trust Co. is moving toward normal. Of the 411 blast furnaces in the country 204 were active on the last day of November. This was 49.6 per cent of the total. When 246 furnaces, or 60 per cent of all of them are active, conditions are at normal. In July the index was 35 per cent below normal. In November it was only 17 per cent below. From July to Nov. 30 a total of 59 furnaces had been blown in.

Pig Iron Production

THE production of pig iron in November climbed to a daily average of 83,775 tons. This was the highest average since May. It was 5.5 per cent above the October level and 45 per cent above the low point in July. In November 1923 there was a decline of 5 per cent from the daily average of the preceding month. The annual rate of production in November was 30,500,000 tons against 29,000,000 tons in October. The recent extensive buying movement has caused prices to stiffen.



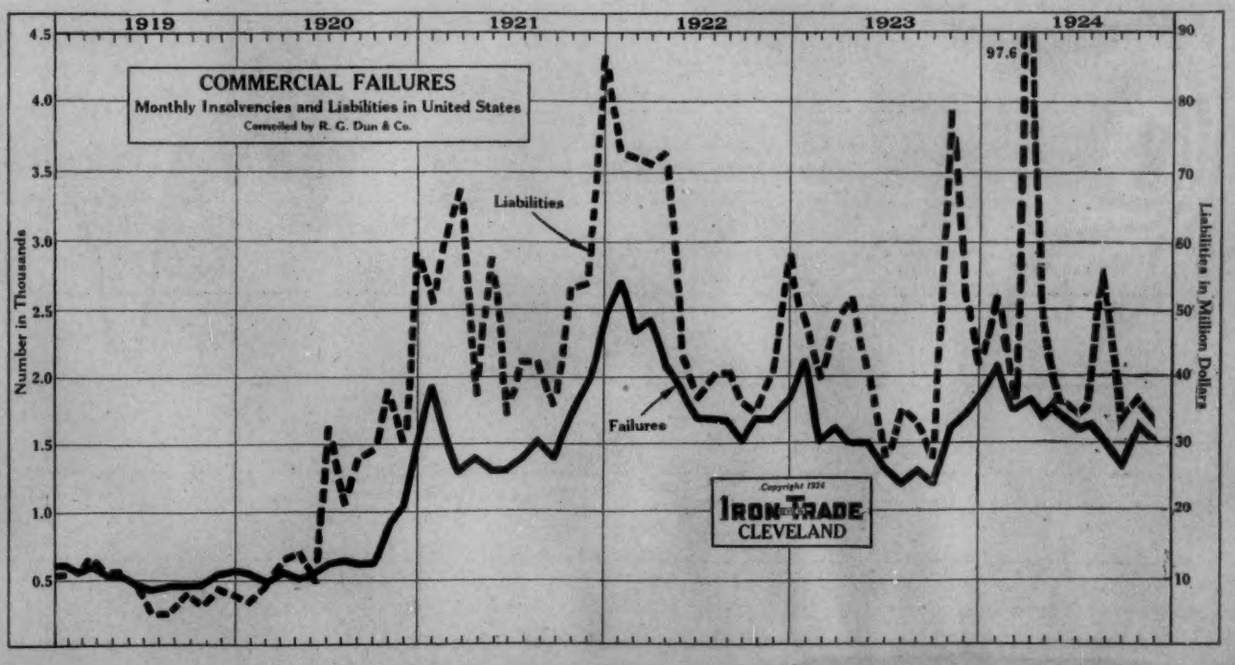


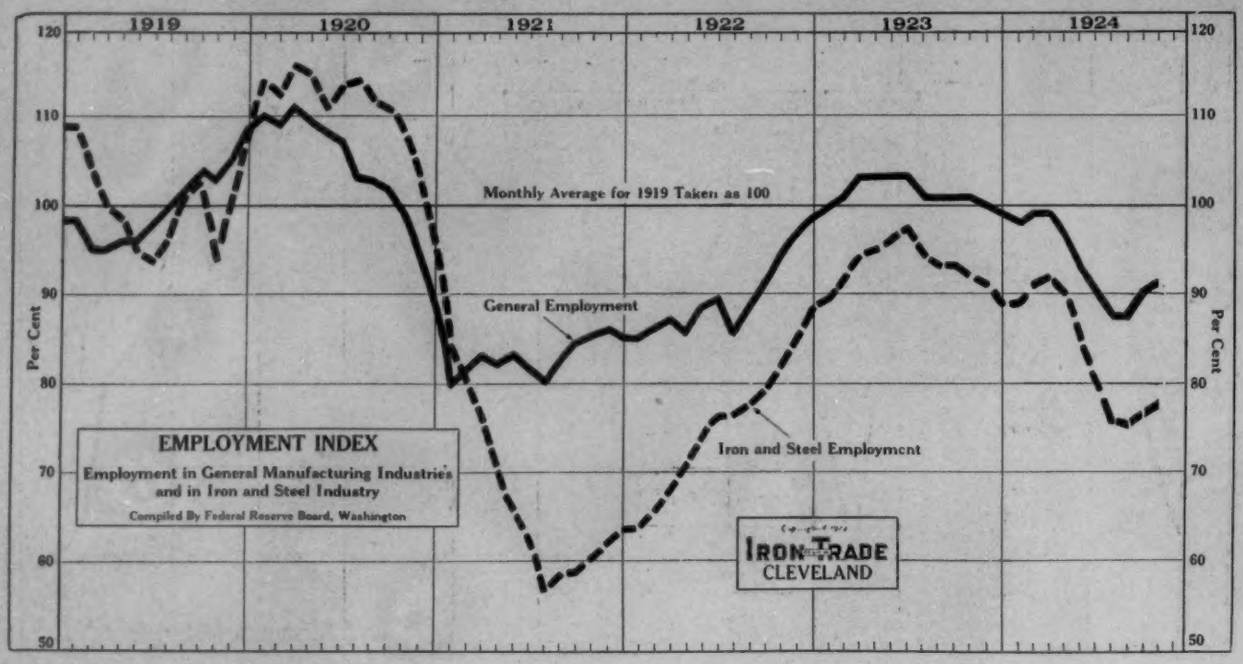
Freight Traffic

FREIGHT movements continue to cling to peaks hitherto unknown for this time of the year. During the weeks ended Nov. 15 and Nov. 22 carloadings passed the 1,000,000 mark. This year is the first time that has ever happened in corresponding weeks of previous years. Grain loadings have been large and coal movements are increasing as production gains. Shipments of merchandise have been heavy due to merchants accumulating large stocks in expectation of an extraordinary holiday trade.

Commercial Failures

A BETTER tone in the business situation is reflected in the record of commerce failures for November. The number of defaults, reported by R. G. Dun & Co., was 1653. Contrary to the usual seasonal tendency the month's total was smaller than in October. It was the smallest figure for any November since 1920. Liabilities amounted to $31,123,910 against $36,098,000 in October and $50,000,000 in November 1923. They likewise were less than liabilities for any November since 1920.



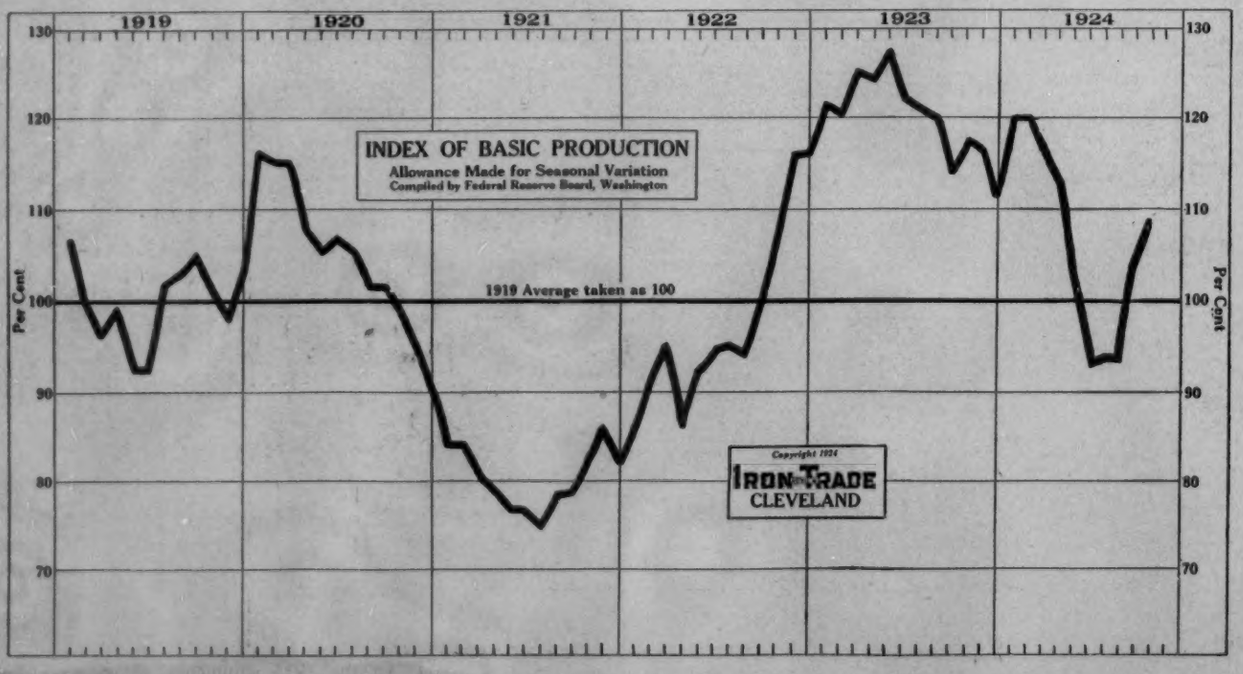


Employment Index

FACTORY employment has been increasing since August. The expansion of activities in iron and steel, textile and various other industries has resulted in additions to the payrolls. Production has increased more rapidly that the numbers employed, however, due to the greater number of hours worked. At the low point of the year employment was at 87 per cent of the 1919 average. In October it was 91.5 per cent. Iron and steel employment has increased from a low point of 75 per cent of 1919 to 78.

Basic Production

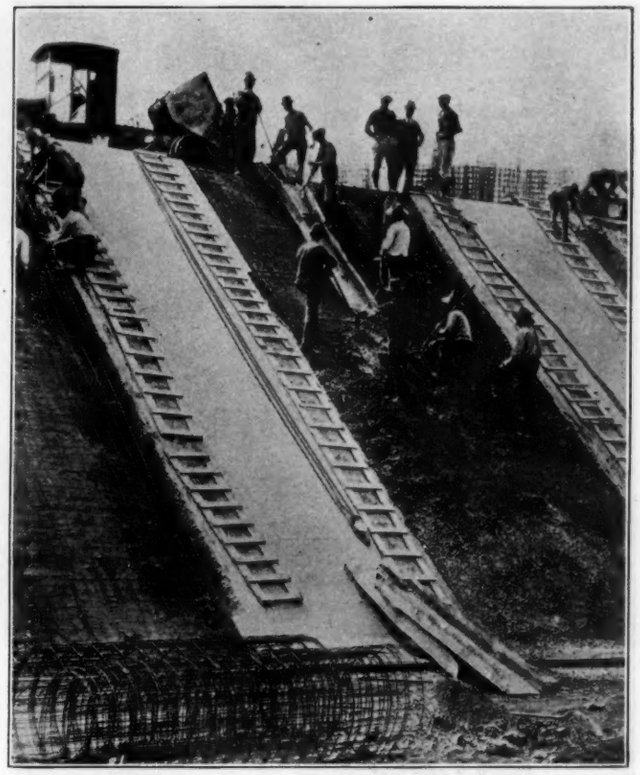
THE production of basic industries has scored a rapid rise since the summer's low point. In June the index of basic output, computed by the federal reserve board, stood at 93 per cent of the 1919 average. It had fallen 16 per cent from the peak in February. July and August brought feeble gains, but in September and October the rise was vigorous. The October level was 109 per cent of 1919, or 16 per cent higher than the June level. The index as derived is adjusted to allow for seasonal variation.



New Demands for Reinforcing Steel

Distribution of Portland Cement Shows Extensive Uses in Various Construction Enterprises—Standardized Forms Employed by Some Builders

BY L. N. DURYEA



REINFORCING A 20-ACRE CONCRETE OIL STORAGE
Large quantities of reinforcing were necessary to build the concrete oil storage at one of the western producing fields

WHILE apparently there is little relation between the portland cement and steel industries, an analysis of the shipments of cement has more than a passing interest to the steel producer. Shipments of cement have for many years served as a good barometer of construction activity; better, perhaps, than is indicated by the production figures of steel, for cement shipments certainly follow the rate of use more closely than in the case of steel. Then, too, portland cement is a standardized product. With steel sold in many and varied shapes and grades, consumption may lag so far behind production that output figures make a poor indicator of true consumption conditions.

The first ten months of this year saw an increase in production and shipments of portland cement over the corresponding period last year, the last seven months making up for the decline in the first quarter of the year. An increase of about 10,000,000 barrels in production and shipments for the year prior to Nov. 1 over the corresponding time during 1923 indicates that the waiting policy of the first few months of 1924 soon gave way to the upward swing that has marked all business recently. Despite this increase in production, there is no fear of a cement shortage, as the industry as a whole has this year carried larger stocks than last, and for the year has operated considerably below capacity.

Further than this value as an indicator, the shipments of portland cement provide more direct concern to the steel producer because of the fact that some 60 per cent of the output of cement goes into construction that requires the use of more or less reinforcing material.

What this means to the steel manufacturer is indicated in the production of portland cement last year, approximately 25,500,000 tons. There appears to be a constant increase in the use of reinforced concrete as compared with plain construction. Especially is this true in concrete highway construction. The American Iron and Steel institute figures on the consumption of reinforcing bars provide a good comparison with the increase in the use of cement. Since 1911 the demand for reinforcing bars has increased 163 per cent while during the same period the output of portland cement has increased but 75 per cent, giving a fair indication of the growing demand for reinforced over plain concrete.

The 680,000 tons of reinforcing bars reported by the American Iron and Steel institute as used in 1923, however, is but a part of the total steel used in reinforced construction. Great quantities of steel used in construction but listed under other headings such as shapes, sheets and plates logically should be included in the total tonnage of reinforcing. Then, too, it has been estimated that as much as 60,000 tons of round and square bars find thtir way into concrete construction that are listed merely as bars in the annual reports. To this must also be added at least 100,000 tons of steel mesh.

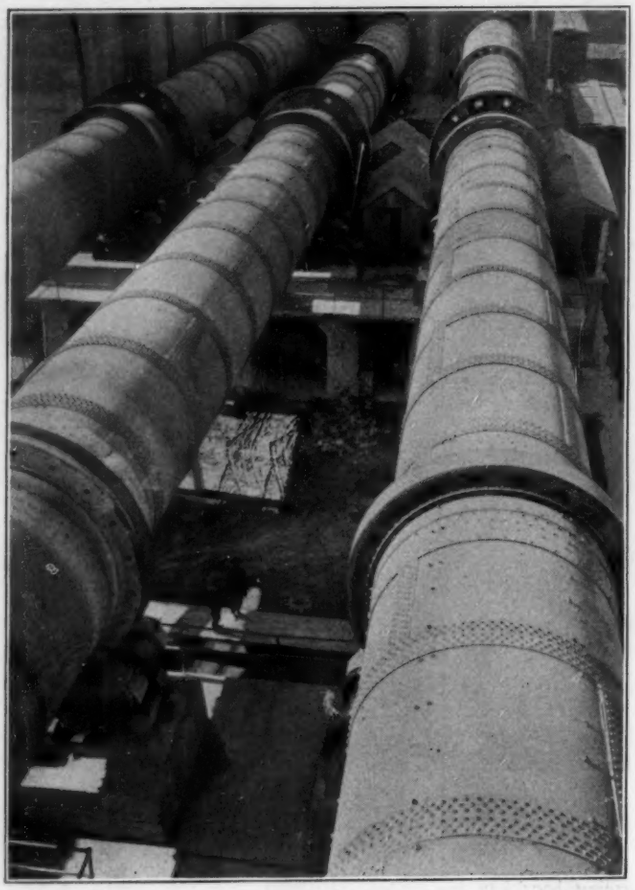
Estimates vary widely as to the total amount of steel used in reinforcing but consensus based on the point of view of the iron and steel producer and the concrete constructor, conservatively place it between 1,000,000 and 1,500,000 tons.

The use of concrete construction has opened many new fields for the steel producer. Take the case of hydroelectric developments. In the building of concrete dams and spillways, considerable quantities of reinforcing material are demanded, yet this field probably would have been closed for the steel salesman, if such projects were limited to earthfill or rubble masonry. There is the Wilson dam of the Muscle shoals development, second only to the locks of the Panama canal as the largest piece of concrete construction in the world. Into its building went some 1,260,000 cubic yards of concrete masonry and a large share of this amount involved some kind of steel reinforcing.

It is interesting to note the estimated distribution of portland cement for the various kinds of construction in which it is used and the quantities of steel reinforcing that these uses involve. The following proportions were based on approximate estimate given in the 1922 United States geological survey report on cement:

	Per cent
Public and commercial buildings	24.9
Dwellings	9.4
Sidewalks and private driveways	6.9
Miscellaneous farm uses	20.6
Concrete pipe for water, sewers, irrigation and culverts	4.3
Paving and highways	24.6
Railways	5.2
Bridges, river and harbor work, dams and water power projects, storage tanks and reservoirs	3.0
Miscellaneous uses	1.7
	100.0

According to the foregoing percentages, the dominating use of cement is in the building of public and commercial buildings, a use that requires the greatest amount and variety of reinforcing material. A similar percentage applied to the 1923 shipments shows that some 33,800,000 barrels of cement were used



BATTERY OF THREE ROTARY KILNS

The raw materials of portland cement are converted into glass hard clinker in rotary kilns among the largest pieces of movable machinery in existence. When in operation some of these kilns weigh as much as 10 all steel pullmans, and are as long as four freight cars

in the United States for this purpose and for the first ten months of this year 32,300,000 barrels found a like use.

Viewing the steel reinforcing industry as a whole for the past few years, the greatest percentage of gain in the use of reinforcing has been for concrete road work. The 24 per cent of the total 1923 output of portland cement was sufficient to provide for the equivalent of 7490 miles of 18-foot concrete road, of which about 5200 miles represent rural highways and 2290 miles city street and alleys. About 3000 miles of this total were reinforced and that use alone took about 45,000 tons of steel.

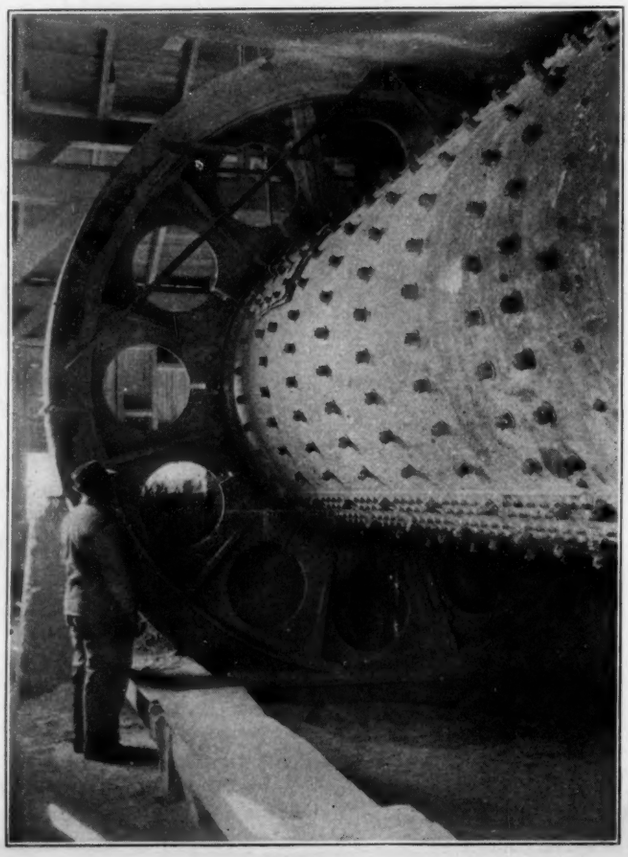
More developments for this use can be expected. Specifications in 30 different states make provisions for either mesh or bar reinforcement. Two additional states specify mesh only and five more limit reinforcement to bars. Naturally what expansion this demand will see will depend on the extension of concrete roads. Statistics for the first ten months in 1924 indicated that this year will see a large increase over the previous year. Up to Nov. 1 more than 6000 miles of rural highway had actually been placed under traffic as compared with a total of 5200 miles for all of last year.

In the other major use of portland cement, miscellaneous farm uses, the steel manufacturer is perhaps less interested although such applications of concrete as building irrigation ditches, silos, storage tanks and the like have called for much reinforcing material.

A casual review of the cement industry will show the greatest increase in the use of this material closely linked with the development of reinforced concrete. When concrete construction was limited to sidewalks, simple foundations and the like that did not entail the use of reinforcing, the cement industry was scarcely upon a secure footing. In the hundred years since portland cement was first patented by a bricklayer in England, its period of greatest growth has been those years when attention has been centered on improving reinforced concrete design.

Historically speaking, reinforced concrete followed close upon the introduction of portland cement. The first use of iron to strengthen concrete was recorded some 25 years after Joseph Aspdin, the English bricklayer, was granted his patent. But reinforcing made little headway until the last three decades and at the beginning of that period portland cement production has not reached 1,000,000 barrels per year in this country. The recent opening of four new plants now brings the total of producing plants in this country to 131, operating in 28 different states and owned by 94 different companies.

While 100 years have elapsed since Aspdin was awarded his patent, it was only 52 years ago that the first plant was started in this country. Today the United States is producing more cement than the remainder of the world com-



BALL GRINDING MILL

Twice during the manufacture of portland cement it must be reduced to a powder finer than flour. Large ball mills have been introduced for this purpose, some of which contain between 30 and 40 tons of steel balls, as much as an average freight car load

bined, and is leading in the development of concrete construction.

The promotion of steel products for reinforcing purposes is not the only interrelation between the two industries. There are few instances where concrete construction does not require some kind of retaining form. Lumber has long been the most popular material for this purpose and last year it has been estimated that nearly twice as much wood was consumed for this purpose as for the entire furniture industry in this country.

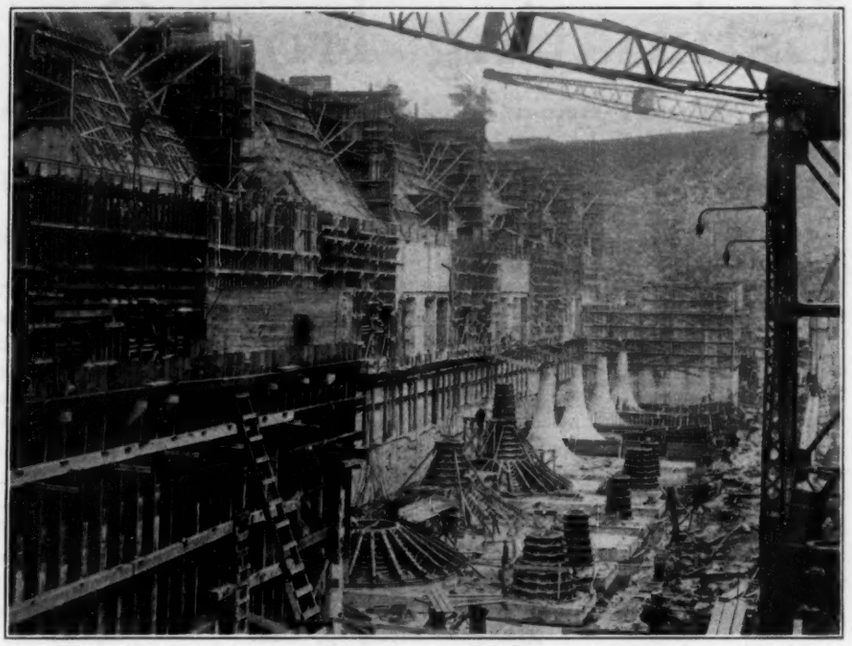
Recently, however, several steel products companies have realized the adaptability of iron and steel forms with the result that some companies have opened up profitable new lines in promoting their use. Obviously, there are many instances where steel forms are uneconomical and impractical. But where the work has been a duplication of units, such as the building of the retaining wall, iron and steel forms have been found to have advantages.

While, no doubt, it is in the creation of new markets for reinforcing steel that the steel manufacturer is most interested as far as the portland cement industry is concerned, there is a considerable quantity of iron and steel used in the maintenance of existing plants and the construction of new units. And this question of maintenance contributes more trade to the iron and steel industry than the average manufacturer would think, for there is, perhaps, no one industry comparable to that of making portland cement that requires such heavy machinery and at the same time handles so abrasive a material.

For example, a cement plant may carry as much as a tenth of its inventoried value in spare parts. Then, too, the general wear and tear of pulverizing the raw materials and later the pulverizing of the burned clinker results in a large demand for steel. In the average cement plant that uses the ball type of grinding mills. replacement will necessitate the purchase of 200 tons of grinding balls alone in a year.

Today this industry is a basic factor in America commerce. Production has increased until now the United States is producing annually well over a barrel of cement for every man, woman and child. It has grown to be the fourth largest manufacturing consumer of bituminous coal—the iron and steel industry is first—and along with its related industry, that of concrete construction, it is supplying more than 10 per cent of the total tonnage of the railroads of this country.

A 16 and 10-inch mill for slitting and rerolling rails and for rolling bar iron recently was installed at the plant of the Kansas City Bolt & Nut Co., Kansas City, Mo. The roughing mill includes seven stands of rolls and the finishing mill two stands. The new unit is electrically driven and has an output of 450 gross tons in 24 hours.



BUILDING WILSON DAM OF MUSCLE SHOALS

In the building of concrete dams and spillways, considerable quantities of reinforcing material have made new demands upon the steel manufacturer that would probably have been closed fields if such projects were limited to either stone or rubble masonry

Locker Styles Reduced

At an unusually representative meeting of manufacturers, distributors and users of steel lockers recently with the division of simplified practice of the department of commerce, a reduction in the present variety from more than 65 sizes and types to 17 was voted. The recent simplification program adopted by the sheet steel industry at Atlantic City was of important aid in discussion of the proposals to simplify locker sizes.

In the double tier locker types, five sizes were adopted ranging from 12 inches in width, 12 inches in depth and 36 inches in height to 12 x 15 x 42 inches. The overall height of these sizes, including leg, is to be 78 and 90 inches.

In the single tier types 12 sizes were selected, these ranging from 12 x 12 x 60 to 18 x 24 x 72 inches, with overall heights of 66 and 78 inches.

The meeting brought together representatives of various associations, including the army and navy and other government bodies. The program of simplification was based on surveys of two years' production. It was voted to make the program effective April 1, 1925, with another general conference to be called April 1, 1926.

Japan Delays Rebuilding

Permanent reconstruction in Japan will not begin for three years, according to the far eastern division of the department of commerce, if the public declarations of the government can be taken as a criterion. There must be plans for the physical reformation of streets and the adjustment of land holdings. Japanese bankers and experienced industrial leaders appreciate the fallacy of the statements of early adjustments, and they go so far as to predict that it will be a decade or longer before this gigantic reconstruction program becomes a reality. The temporary buildings will not give way to permanent construction until necessity requires and in any case they are protected by law for a period of five years. At the end of that period it will depend upon the prosperity of the individual as to whether he will reconstruct his building. In the meantime whether the city and national governments will carry out their announced program of reconstruction and expansion of public utilities prior to the expiration of the five-year period, remains a question. The present temporary structures have been built on approximately the old locations and the carrying out of the ambitious street reconstruction program will involve the destruction or removal of a large number. The protection of these buildings for a period of five years will automatically postpone the street improvement plan until the expiration of that period.

Estimating Iron Ore Resources

World's Actual Supply Sufficient for 76 Years; Potential Tonnage To Be Exhausted by Year 2200—Amount Available Compared with Increasing Rate of Consumption of Pig Iron

ANOTHER 76 years will see the exhaustion of the world's actual iron ore reserves if consumption continues to increase at the present rate, said Charles Page Perin, Perin & Marshall, consulting engineers, New York, in a recent lecture at Princeton university. This will be followed, not later than the year 2200, by the complete exhaustion of the world's total reserves, including all tonnage now thought to exist, he stated. Mr. Perin's conclusions were based on a thorough study of all the factors involved in the world's iron situation and they included no provision for future consumption in excess of the present rate of increase. The following is a summary of Mr. Perin's address:

Actual known iron ore reserves of the world aggregate 33,745,000,000 metric tons, which are equivalent to 15,818,000,000 metric tons of iron. In addition, there are potential iron reserves thought to aggregate 99,342,000,000 metric tons, equivalent to 53,137,000,000 metric tons of iron.

Per Capita Peak in 1913

Per capita pig iron production for the world was about 106 pounds in the peak year 1913. In the United States it was highest, at 730 pounds, most of the iron being consumed at home. The five important pig iron producing countries of the world, the United States, Germany, Great Britain, France and Belgium, have 15.5 per cent of the world's population and produce 87.5 per cent of the world's pig iron. Assuming that population will grow at the rate as in past years, there will be 4,200,000,000 people in the world by the year 2200, as compared with the present 1,800,000,000. A continuation of the past rate of increase in production augurs a rate of output in the year 2200 of approximately 375,000,000 gross tons. This will be equivalent to about 200 pounds per person. In the light of the possibilities for great increases in consumption in various parts of the world, it is felt that this estimate may be regarded as entirely conservative.

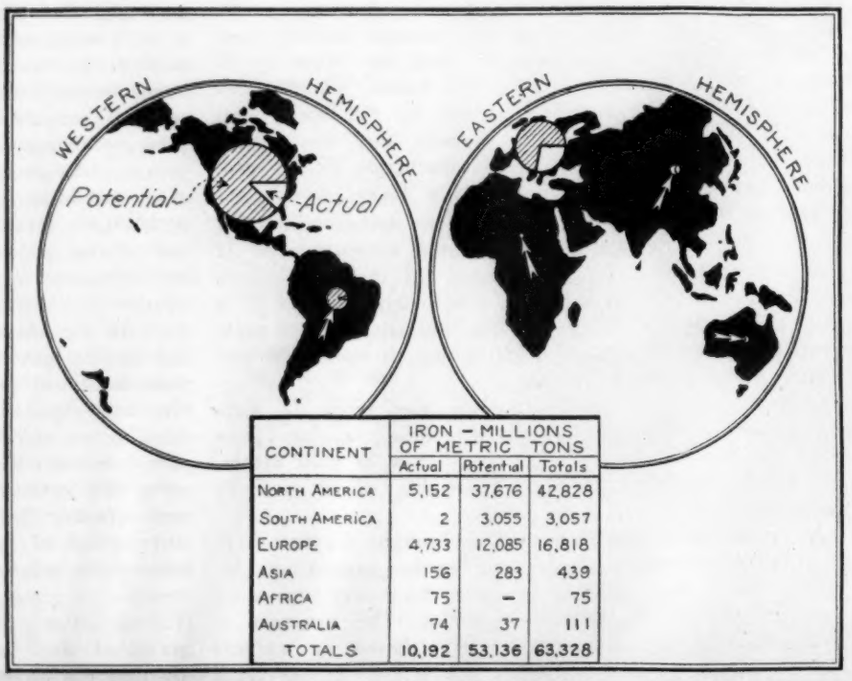
Coal, the universal fuel for converting iron ore into iron, is present in the world in proportionately much larger quantities. The actual coal resources of the world aggregate 716,154,000,000 tons, while it is probable that the potential total is as great as 7,397,553,000,000 tons. At the present rate of consumption, it will take 3300 years to exhaust the entire supply of bituminous and better grade coals.

Mr. Perin defined civilization as the result of man's capacity to co-operate for the benefit of the human race. Two fields of utility, he said, are essential for the advance and maintenance of civilized man. First of these is the development of energy. The second is the construction of vessels for retaining and transporting food and other products of labor. He traced the development of transportation and other facilities and activities and stated that all other metals are secondary to iron and copper. Mr. Perin emphasized the importance of the cheapness of iron as a factor in hastening the development of civilization. Even with primitive smelting apparatus, he said, the cost of producing iron was about one-third that of producing bronze; at the present time the ratio is about 1 to 10.

Figures submitted by Mr. Perin did not include consideration of the reserves of sulphides of iron, such as pyrite and pyrrhotite. "In the recent development in the art of electrolytic iron recovery," he said, "we have been able to secure pure iron from these ores and recover the sulphur as a by-product. This will be a source of iron of appreciable importance over and above the accepted oxide and carbonate ores."

Rust Losses Appalling

Losses of iron by corrosion are appalling, said Mr. Perin. In the last 34 years there has been a net gain of 31,000,000 tons per year in the production of iron. But there has been a loss due to corrosion and other causes of over 21,000,000 tons per year. That is, that amount of iron had to be scrapped or replaced principally because of damage by corrosion. Mr. Perin said recent study has shed much light on the causes of corrosion, and much has been revealed as to how to overcome or restrict corrosion. But much effort still is to be expended along this line. "No greater field exists for the ingenuity, administrative ability and technical skill of the engineer, be he closely identified with the manufacture of iron and steel or with its uses," he said. "When you realize that there has taken place, during the lifetime of the speaker," said Mr. Perin, "the development and application of the bessemer process, of the open-hearth process and the development and application of electricity, the telephone, the gas engine, the automobile, the high-speed steam turbine, and a vast number of other contributions to the comfort and wealth producing possibilities of the human family, it will be



CONTINENT	IRON — MILLIONS OF METRIC TONS		
	Actual	Potential	Totals
North America	5,152	37,676	42,828
South America	2	3,055	3,057
Europe	4,733	12,085	16,818
Asia	156	283	439
Africa	75	—	75
Australia	74	37	111
TOTALS	10,192	53,136	63,328

MAP OF THE WORLD SHOWING ACTUAL AND POTENTIAL RESERVES OF IRON

clear to you that our best thoughts must be given to the preservation of these most valuable developers of civilization, all of them dependent upon iron and steel."

Increased Mine Activity Reported for 1923

The metal mining industry of the United States employed 123,279 men in 1923, representing an increase of 17 per cent over the number employed in 1922, according to statistics compiled by the department of the interior through the bureau of mines. The volume of work performed was equivalent to 36,559,805 men-shifts of labor, or 25 per cent more than in the preceding year. The death rate from accidents at the mines was lower than has ever before been recorded, but the nonfatal injury rate continued to rise. The fatality rate was 3.01 per 1000 men employed, calculated on a standard of 300 work days per man per year; the injury rate was 275 per 1000 men. Prior to 1923 the lowest fatality rate was 3.09 for the year 1921; the highest was 4.45 for 1911. The actual number of men killed by accidents in 1923 was 367; the number injured was 33,563, each injury incapacitating the employe for one day or more.

The reduction in the fatality rate for 1923 is credited to iron mines and to the gold-and-silver group of mines, as there was a slight increase in the fatality rates for mines producing copper, lead, and zinc, and nonmetallic minerals.

The volume of work done, as indicated by the aggregate number of man-shifts of labor performed by all employes, indicated increased activity in all of the major branches of mining. The increase, as compared with 1922, was 37 per cent at copper mines, 35 per cent at iron mines, 11 per cent at gold and silver mines, 19 per cent at lead and zinc mines in the Mississippi valley states, and 12 per cent at mines producing nonmetallic minerals.

Urge Formation Bureau of Public Works

In promulgation of his annual report, Secretary of the Interior Hubert Work recommends that a bureau of public works be established under which all the construction and engineering work performed by the government should be centered. He also favors covering into one department and under one cabinet secretary the territorial affairs of Alaska and Hawaii instead of the present system of operating them through a multiplicity of bureaus scattered through various departments.

Among accomplishments of the interior department in the year are listed the following:

Demonstration that a good grade of foundry iron can be produced from steel scrap in the electric furnace, of special importance to the development of an iron industry on the Pacific coast.

Improvement of the bureau's sponge iron furnace so that almost any type of iron ore can be smelted to make sponge iron.

Blowing in of a new experimental blast furnace which is "bigger and better" than the one successfully operated last year.

Obtain comprehensive data on briquetting practice in the retorting of zinc ores, which will enable a zinc operator to select the process and the type of briquet best suited to his purpose.

Made a thorough study of methods of retorting residues from zinc smelters, which carry 5 to 15 per cent of the zinc charged.

Studied the loss in copper smelter slags, and mapped out a program for a determined attack on this problem.

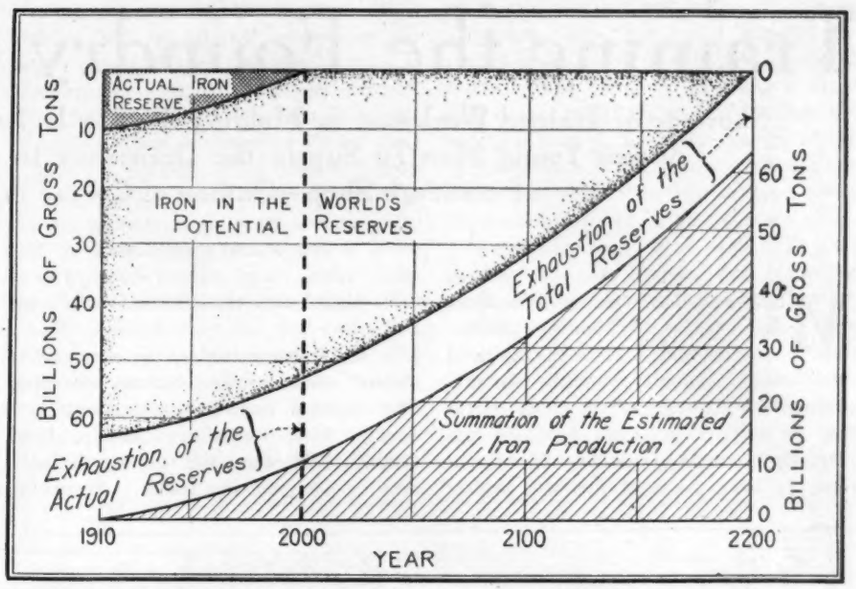
Finished a comprehensive survey of ore-dressing practice in the United States in co-operation with the Institute of Mining and Metallurgical Engineers.

Developed an efficient classifier for treating complex lead-zinc ores, which is being used in several large western mills treating ores of this type.

Rendered assistance at 25 mine accidents, 22 of which were in coal mines and three in metal mines and trained 17,767 men in first aid and mine rescue, which was an increase of 2826 over the number trained in the previous year.

Developed a standard test for determining fineness of pulverized coal; completed combustion tests on efficiency of a large power plant, using pulverized coal, and finished an investigation of explosion hazards in the handling and use of powdered coal.

A 30-ton open-hearth furnace recently was added to the steelmaking facilities of the Hubbard Steel Foundry Co., East Chicago, Ind. The company has rearranged its foundry equipment for straight line production.



ACTUAL AND POTENTIAL IRON RESERVES, WITH SUMMATION OF ESTIMATED PIG IRON PRODUCTION

Farm Equipment Gains

The department of commerce announces that, according to data collected at the annual canvass of manufactures of farm equipment, the total production of such equipment in 1923 was valued at $364,701,537, compared with $209,639,897 in 1922 and $328,040,783 in 1921. The 1923 total represents increases of 74 per cent over 1922 and 11.2 per cent over 1921. The production of most classes of farm equipment in 1922 fell below the 1921 totals, but the 1923 output exceeded that reported for 1921.

Sales of farm equipment by manufacturers in the United States in 1923 aggregated $311,823,230, as against $222,907,764 in 1922; and sales for export in 1923 amounted to $49,349,542, as against $21,663,241 in 1922.

The data for 1923 were reported by 1069 manufacturing establishments; for 1922, by 986 establishments; and for 1921, by 1146 establishments. Some of these establishments were engaged primarily in the manufacture of farm equipment, while others reported such equipment only as a minor product.

Start New Pipe Mill

A new buttweld pipe mill recently was placed in operation at the plant of the Central Tube Co., Economy, Pa. giving the company three units of this type. A new lapweld mill designed to produce pipe from 2 to 8 inches diameter is expected to be completed during 1925. Four gas producers built by Wellman-Seaver-Morgan Co., Cleveland were installed this year and three additional units of the same type now are under active construction.

Training the Foundry Apprentice

Shortage of Trained Workmen in Molding Trades Is Becoming Alarming—Preparing Young Men To Supply the Deficiency Is the Remedy of a Pittsburgh Shop—Outline of Course Is Given

BY R. A. PEEBLES

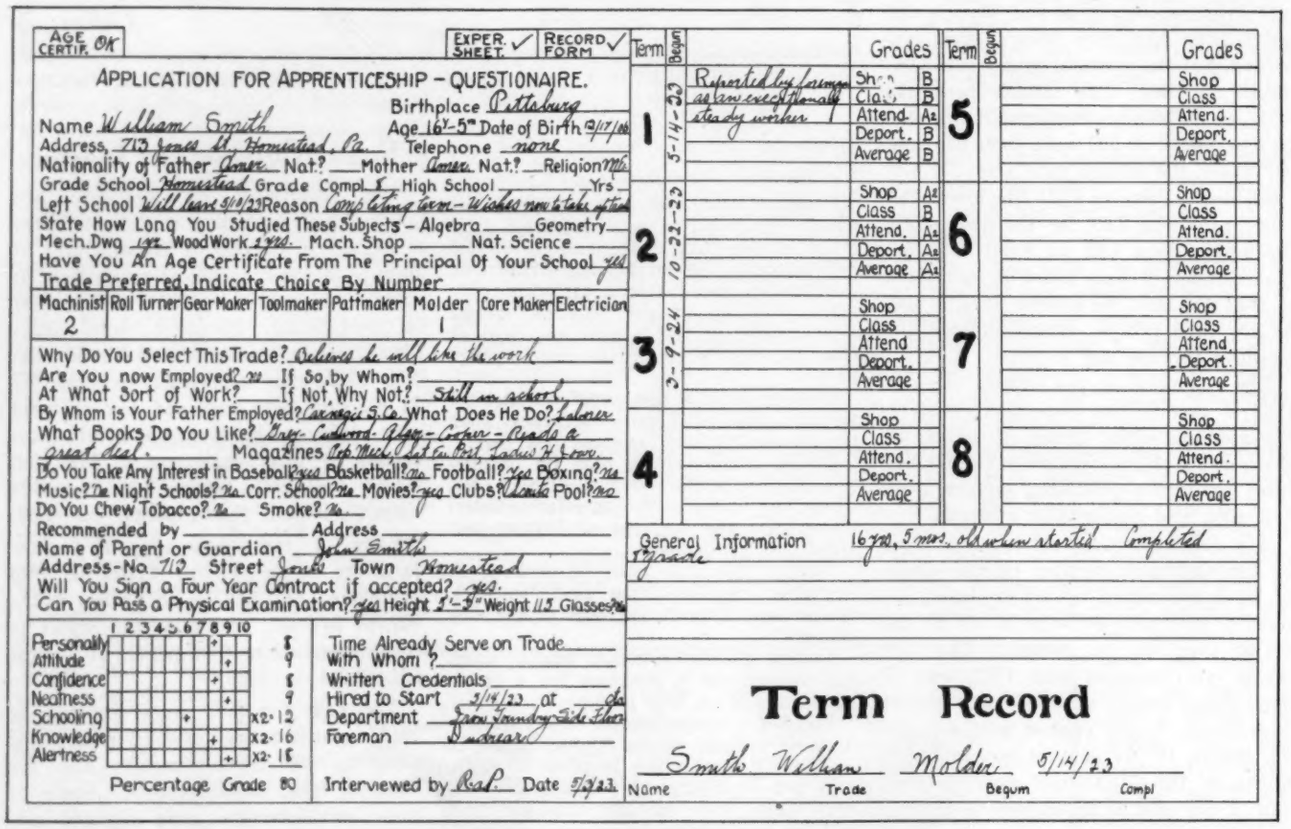
MEN who have mastered a trade are scarce. Quantity production tends to narrow the scope of each man's activities. With the restriction of his work to a single operation or a short connected series of operations, a natural tendency is encountered to learn the operation and neglect the remainder of the manufacturing process. The heavy premium placed on speed strongly favors this tendency. Green men are brought into a manufacturing plant and put through a brief course of training on a particular operation. In a few days they are able to run a machine or get away with the job. For a number of years previous to the war it was noticed that well trained workmen were becoming rare. The war woke us up for a brief period, to the necessity for training men. After that period of stressful struggle, a majority of firms lapsed into their former indifferent attitude.

In the foundry trades, the shortage of trained workmen has become alarming. The National Founder's association, in a circular letter to the membership, dated Oct. 27, 1922 urges the training of more men in the foundry trades. From the estimate of the situation the nation is at least 30 per cent short in this particular branch of skilled labor. A few shops it is stated were making earnest efforts and getting results; but many, unfortunately, were doing absolutely nothing. This was borne out by a partial census of the firms in the Pittsburgh district taken about a year ago to determine the status of foundry training. Out of about 40 of the larger concerns consulted only two or three were doing anything toward training apprentices.

The company with which the author is associated, builds a variety of heavy machinery and long since realized that the considerable number of skilled mechanics required in the work could be secured only by a thorough course of training in its own plant. The machine and pattern trades are given their share of attention in our plant, but because of the prevailing scarcity of skilled foundry workers, naturally we have laid considerable stress on apprenticeship in the foundry trades. This article is confined to this particular branch of the metal trades.

The work handled in the foundries of this company covers a wide range in both iron and steel castings. Some are light enough that the flasks may be handled by the molders themselves, while those on the main floor are up to the limit of present day equipment. Because of the nature of our work no molding machines are used. For the same reason a great number of our molders must be good mechanics having a wide general experience.

In starting the training of molders and



AGE CERTIF. OK — EXPER. SHEET ✓ — RECORD FORM ✓

APPLICATION FOR APPRENTICESHIP – QUESTIONAIRE.

Name William Smith — Birthplace Pittsburg — Age 16y-5m Date of Birth 9/17/06
Address, 713 Jones St. Homestead, Pa. — Telephone none
Nationality of Father Amer. Nat.? — Mother Amer. Nat.? — Religion? Meth.
Grade School Homestead Grade Compl. 8 — High School — Yrs.
Left School Will leave 9/12/22 Reason Comp. 8th grade – Wishes now to take up trade
State How Long You Studied These Subjects – Algebra — Geometry —
Mech. Dwg 1 yr Wood Work 1 yr Mach. Shop — Nat. Science —
Have You An Age Certificate From The Principal Of Your School yes
Trade Preferred. Indicate Choice By Number

Machinist	Roll Turner	Gear Maker	Toolmaker	Pattmaker	Molder	Core Maker	Electrician
2					1		

Why Do You Select This Trade? Believes he will like the work
Are You now Employed? no If So, by Whom? —
At What Sort of Work? — If Not, Why Not? Still in school.
By Whom is Your Father Employed? Carnegie S. Co. What Does He Do? Laborer
What Books Do You Like? Boys' Cultured Alger – Cooper – reads a great deal. Magazines Lib. Mich. Post Ev. Post, Ladies H. Journ.
Do You Take Any Interest in Baseball? yes Basketball? no Football? yes Boxing? no
Music? no Night Schools? no Corr. School? no Movies? yes Clubs? Scouts Pool? no
Do You Chew Tobacco? no Smoke? no
Recommended by — Address —
Name of Parent or Guardian John Smith
Address-No. 713 Street Jones Town Homestead
Will You Sign a Four Year Contract if accepted? yes.
Can You Pass a Physical Examination? yes Height 5'-5" Weight 115 Glasses? no

	1 2 3 4 5 6 7 8 9 10	
Personality		8
Attitude		9
Confidence		8
Neatness		9
Schooling	x2	12
Knowledge	x2	16
Alertness	x2	16
Percentage Grade		80

Time Already Serve on Trade —
With Whom? —
Written Credentials —
Hired to Start 5/14/23 at —
Department From Foundry Side Floor
Foreman Duncan

Interviewed by Asst. Date 5/7/23.

Term	Begun		Grades		Term	Begun		Grades
1	5-14-23	Reported by foreman as low excep. but only steady worker	Shop	B	5			Shop
			Class	B				Class
			Attend.	A+				Attend.
			Deport.	B				Deport.
			Average	B				Average
2	10-22-23		Shop	A+	6			Shop
			Class	B				Class
			Attend.	A+				Attend.
			Deport.	A+				Deport.
			Average	A+				Average
3	3-9-24		Shop		7			Shop
			Class					Class
			Attend					Attend.
			Deport.					Deport.
			Average					Average
4			Shop		8			Shop
			Class					Class
			Attend.					Attend.
			Deport.					Deport.
			Average					Average

General Information 16 yrs, 5 mos. old when started Completed 8th grade

Term Record

Smith William — Molder — 5/14/23
Name — Trade — Begun — Compl

FIG. 1—QUESTIONNAIRE USED TO BRING OUT APPLICANT'S PERSONAL QUALIFICATIONS. FIG. 2—A GENERAL RECORD OF THE APPRENTICE'S STANDING IN SHOP, CLASS, ATTENDANCE AND DEPORTMENT

The author is director of education Mesta Machine Co., Pittsburgh.

coremakers it was apparent that we could not rely upon applications for these trades. No prospects applied. It was necessary to go out and explain the proposition to the right sort of boys and their parents. Applications for apprenticeship positions were chiefly for the pattern and machinist's trades, more than half of the applicants selecting the pattern shop. In the author's opinion this is due to the fact that the majority of schools give manual training in woodworking only. The boy finds this sort of work clean and pleasant and if fairly successful at it he easily persuades himself that it is the trade to which he is most suited.

A word should be said here about manual training as affecting foundry work. Except in small schools where funds are limited and only the most elementary sort of instruction can be given, there is no reason why manual training should be so confined to woodworking. A molding tub long enough to accommodate five or six boys, with an outfit of wood or metal flasks and a few necessary tools is an inexpensive addition to the manual training equipment. The whole installation with a supply of sand would cost hardly as much as a single lathe and would occupy a space only about 15 feet long by 6 feet wide. If a melting furnace for soft metal is out of the question, the molds may be cast with a thin plaster of paris mixture. Manual training at best is not trade training and is intended to develop the natural tendencies of the pupil, and implant correct ideas of the trades covered. Most boys, having never seen a foundry, accept their impressions from their parents or teachers. The author knows of one case in which the instructor in manual training, a patternmaker by trade, told his class that it took brains to make patterns, but anyone could make castings after the patterns were ready. The school presided over by that man has good molding equipment, and the last time the author visited the molding department, it was in use as a pattern storage room. Each year a large class graduates from that school in pattern making, machine work and drafting; but none in molding.

In addition to the handicaps mentioned many parents try to guide their boys into the easy trades. They forget, or perhaps they do not know, that a man's mental attitude makes his work easy or hard as the case may be. Most of the heavy work of the molder, such as sifting, ramming sand, and lifting flasks, is done by mechanical means. Such shoveling and ramming as must be done by hand makes molding one of the most healthful trades. It is no trade for one who is looking for a sinecure. It means activity all day long and a tired body at quitting time. It is as safe as the average trade, in a modern foundry, heated in cold weather and well ventilated at all times, with hot metal handled by cranes or by hoists running on overhead tracks. The elements of danger from dust or hot metal are no greater than the ordinary hazards found in average shops. In the opinion of the author, they are not nearly so serious as the hazard from the machines used in any pattern shop.

Notwithstanding these difficulties we usually are able to sort out from the applicants that present themselves, enough suitable boys for the foundry. A certain premium, such as a higher rate of pay, is placed upon the selection of the foundry trades. Where other considerations are balanced the higher rate of pay usually determines the applicant in favor of the foundry. Of course, it is necessary to guard against boys selecting foundry work solely on account of the higher rate. This is taken care of by a careful questionnaire shown in Fig. 1 and designed to bring out the applicant's personal qualifications. This further is assisted by mental and physical examination.

In determining the percentage grade, the first items are estimates. Under the head of schooling, 10 is taken to mean 4 years of high school of which 1 stands for third grade. Knowledge, mentality, and alertness are determined by examination. Double weight is given to schooling and alertness.

Apprentices starting between the ages

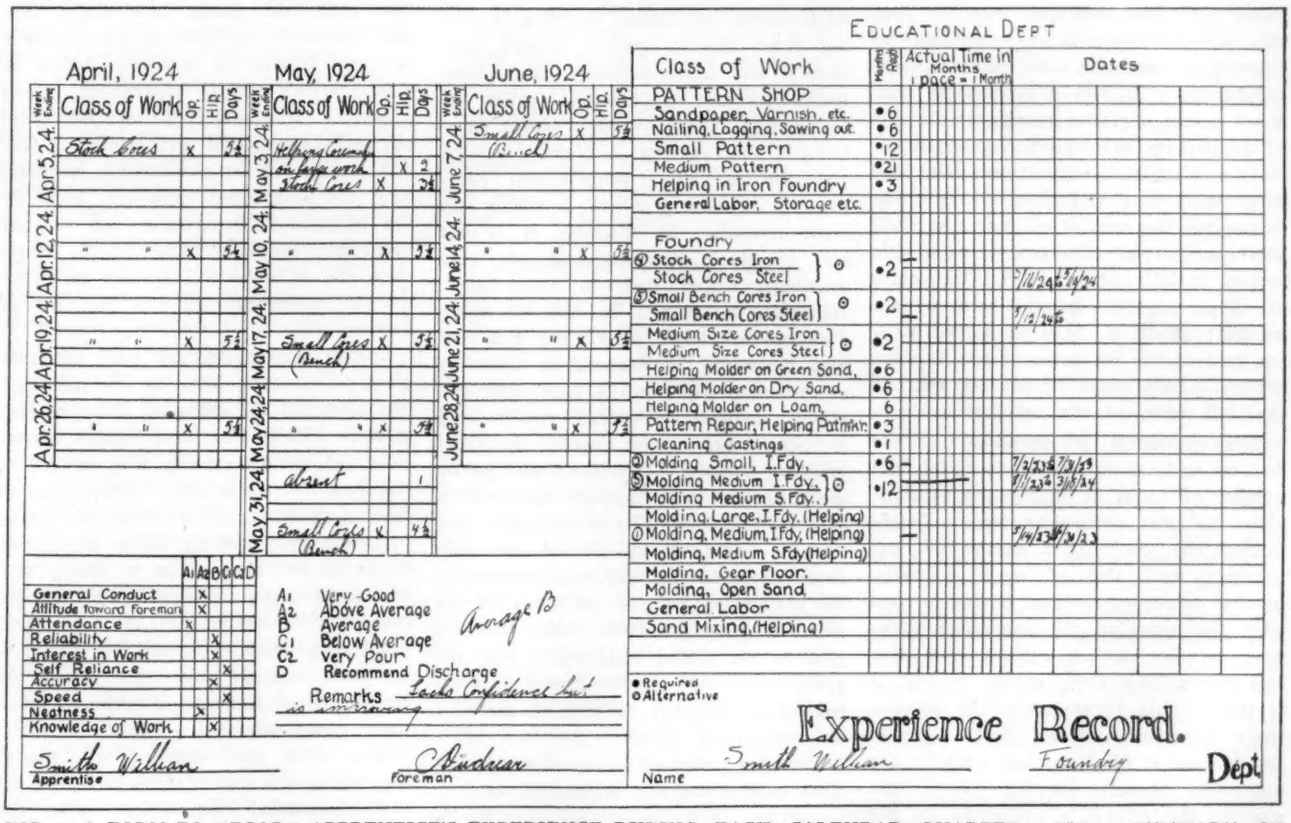


FIG. 3—A FORM TO RECORD APPRENTICE'S EXPERIENCE DURING EACH CALENDAR QUARTER. FIG 4—SUMMARY OF APPRENTICE'S EXPERIENCE THROUGHOUT HIS ENTIRE COURSE

of 16 and 18 years are classed as regular apprentices. They receive the regular course of instruction in class and shop and their rate of pay is determined by a prearranged schedule of hour-rates which is the same for every regular apprentice in the foundry department. Normally, we carry about one regular apprentice to five journeymen throughout the shops.

Course Is Four Years

Regular apprentices are taken under contract for a period of training, nominally four years in length. The course is divided into eight terms of six months each. Since superior mental and physical qualifications enable some boys to acquire the essentials of their trade at a faster rate than others, it was felt that this difference should be recognized by shortening materially their period of apprenticeship. A boy is placed on trial for a period of three months, at the end of which time he is given a grade based on his attendance, deportment and his progress in shop and class. This grade determines the number of hours he shall serve to complete the first term of his course, as follows: Grade A, 1053 hours, or 75 per cent of the full term of six months; grade B, 1228 hours, or 87½ per cent of the full term of six months; grade C, 1404 hours, or 100 per cent of the full term of six months.

The apprentice is examined at the end of each term, his grade fixing the number of hours he shall work to complete the next succeeding term. Determining the grade is a matter of importance, and also of some difficulty, because not every foreman is able to consider the work of the apprentice without prejudice for or against him. For this reason, the form shown in Fig. 3 is used. This form covers the apprentice's experience during each calendar quarter and is filled in each week by the apprentice himself. At the end of the quarter the record is submitted to the foreman for his estimate of the boy's standing. Ten characteristics are considered, a separate grade being given for each. This is to obviate the tendency shown by some foremen to give a good boy or a personal favorite higher grades than their actual ability warrants or to disparage a boy disliked for personal reasons. Should such a tendency be shown it is explained to the foreman that only an exceptional boy could grade extremely high in all of these characteristics. On the other hand, it may be shown that no boy who passed our physical and mental tests would be likely to grade low in all, or even in a majority of them. By the time a boy has been discussed and graded by two or three successive foremen, the educational department will have arrived at a fair estimate of his real ability in practical performance.

A summary of the apprentice's experience throughout his course is kept on the experience record as shown in Fig. 4, entries being made at the end of the quarter from the form shown in Fig. 3. A general record of his standings in shop, class, attendance and deportment, with dates of promotion, increases in rate and any general information is kept on the term record form, Fig. 2.

Regular apprentices receive instruction in the class-room twice per week, four hours in all, during which time they receive their regular rate of pay. They are expected to put in an equal amount of time on their studies at home. The course of instruction covers mathematics, mechanical drawing, sketching from objects, general science, economics, and trade subjects. The mathematics includes a general review of arithmetic, algebra, through simple equations, a short course in plane geometry, and the use of trigonometrical functions in solving problems involving the right triangle. In drawing, it is our aim to teach the apprentice to read drawings, rather than to make them. However, he should be able to make drawings of simple parts. For this reason, most of his drawing is done on cross-section paper, using only scale and pencil compass. General science and economics are taught partly by short talks on a series of subjects, and partly in connection with applied mathematics or shop problems. Twice a month each class is addressed by one of the shop superintendents on subjects concerning his particular trade or the work of the plant in general. These talks also are open to the special apprentices, who are given notice to attend. Every superintendent is expected to respond for this duty on proper notice.

The shop schedule for regular apprentices in the foundry is as follows:

	Months
Stock cores, iron or steel core room	2
Small bench work, iron or steel core room	2
Medium size work, iron or steel core room	2
Helping on green sand	6
Helping on dry sand	6
Helping on loam	6
Pattern repair	2
Cleaning castings	1
Molding, small, iron foundry	6
Molding, medium, iron foundry	12

These items cover 45 months. In some cases a boy may remain in a department longer than the scheduled time, but if his progress is what it should be, this will not occur often. The remaining three months covers such irregularities. In case an apprentice receives an *A* or *B* grade, his time in each department will be shortened in proportion.

Regular apprentices receive, during the first term of their apprenticeship, 35 per cent of the wages paid to journeymen of the second class. The rate is advanced by regular increments until during the eighth term they are earning 80 per cent of this rate. At the conclusion of their apprenticeship they are advanced to the full rate of second class journeymen.

After completion of the course, the apprentice is placed on the work for which he seems best fitted, his own preference being consulted so far as possible.

Special Course Provided

It was recognized that many older boys and young men would be glad to learn a trade but were deterred by the low rates paid to regular apprentices. Most boys past 18 years of age must earn their living or assist in the maintenance of the home. It was decided that boys and young men above that age who were ambitious to learn a trade or some branch of a trade, should be taken on as special apprentices Such prospects are subjected to the usual physical examination and while no formal mental test or examination is given, they are questioned carefully, both by the educational department and by the department superintendent under whom they are to work. They are hired by mutual agreement of the two as to fitness, etc.

Special apprentices are paid the rate given to common labor at the start and are advanced according to their earning power. Those who have limited education and natural ability are trained in one line of work only. They become steel coremakers, roll molders, etc. Some of these men quickly show themselves to be above the average in ability and are given every opportunity to become competent foundrymen. A few men, graduating from technical high schools or trade schools take this means of gaining the experience necessary to make them competent.

The rates and standings of special apprentices are reviewed each month by the educational department with the foundry superintendent, that progress or lack of progress may not be overlooked. A record of the experience is kept on the same form as that used for regular apprentices, and grades are taken each quarter in the same manner. These men remain in training about two years. They are given a certificate at the end of their training period, covering the line of work in which they have become proficient.

In most foundries supervision is subdivided sufficiently that the foreman can act as instructor, and it is the author's opinion that where this is feasible and the foreman competent, he should so act. This company tried this method first and then secured a first class man of good record as molder and

(*Concluded on Page* 1578)

Controls Manufacturing Methods

Machine Tool Builder Provides Separate Organizations and Equipment for Each Product and Regulates the Output by Orders Rather Than by Records—Routing of Work Through the Shop Is Described

BY RALPH E. FLANDERS

ABOUT 12 years ago the management of the Jones & Lamson Machine Co., Springfield, Vt. began an intensive campaign for the increase of speeds and feeds, improvement in methods of doing work and controlling it, and development of all the other lines of progress which in general come under the head of "scientific management." This work was guided at times by members of the company's own force, and at times by an outside organization of specialists. The net result of this several years of effort was decidedly profitable. Speeds and feeds were greatly increased, and the total machining time and total direct labor cost of the product noticeably reduced—and this in the face of considerably increased earnings to the men. All of this is, of course, the expected result of successful work of this kind.

About four or five years ago, however, we lost the first keenness of our interest in direct labor cost and became concerned with the "overhead." With only a moderate increase in output, there had been a considerable increase in the number of foremen—functional and otherwise—and a great increase in the amount of clerical work they were called on to do. In fact, it had become necessary to provide many of them with clerks. There was also a violent increase in the personnel of the cost and production offices. The attempt to control the whole organization from a central point led also to a flood of written orders and reports, which was evidenced by the multitude, variety, and size of our printing bills.

At any time and at any point in the shop, a rough estimate could be made as to the percentage of the men in sight who were at that moment actually engaged in the processes of profitable manufacture, and to find that percentage unsatisfactory. Finally, the general statistics of the plant showed that the direct labor cost of the product was small. It showed the material cost as much higher; but the manufacturing overhead so large that with a moderate selling expense the percentage of profit was somewhat precarious. The percentages were, in fact, such that if the item of direct labor cost had been completely eliminated, there still would not have been any extraordinary profits at the selling prices prevailing.

From a paper presented at the annual meeting of the American Society of Mechanical Engineers, New York, Dec. 1-4. The author, Ralph E. Flanders, is manager, Jones & Lamson Machine Co., Springfield, Vt.

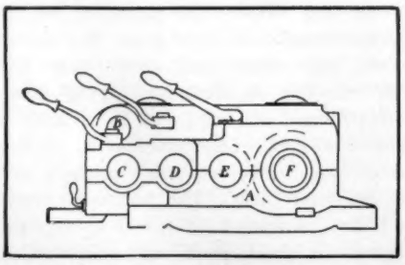


FIG. 1—END ELEVATION OF A 3-INCH HEADSTOCK

Investigates Overhead Cost

We are not the only manufacturers, or the first, who have made this interesting discovery. But whenever and wherever made, this discovery is a matter of the highest importance, and should lead to a radically changed treatment of the problem of management. In our case progress toward efficiency in direct labor cost had reached the point where the "law of diminishing returns" became effective, and further effort in that direction would be unprofitable. We therefore transferred our attention to the other elements of cost, and particularly to the largest of them—the manufacturing overhead.

The overhead cost had not grown to its preponderant dimensions suddenly or through carelessness. It was the result of slow accretions of small expenses, each added to take care of some real difficulty in management in what looked, at the time, like the simplest and least expensive way. An examination of the various details did not indicate that they could be successfully improved by individual treatment. To put it briefly, the major operation consisted in rearranging all the elements of the business so that difficulties were avoided rather than overcome.

The oldest and principal product of the company is the Hartness flat-turret lathe. Other important products are the Fay automatic lathe and the Hartness automatic opening die. A beginning in segregation had been made some years before in developing the automatic die into a separate business, with its own manufacturing organization and equipment. The Fay automatic was first assembled in a department of its own; it was now in turn provided with a practically complete equipment for making all its parts and given separate quarters.

In the turret-lathe division the work was of two kinds—the manufacture of new machines, and a rather large service business in the supply of replacement parts for the machines (numbering some 15,000) now in the users' hands. Many of these parts were obsolete, being for machines of a design established in 1893. The others were of the then current design, established in 1905. The final, and significant, act of segregation consisted in separating the service department completely from the turret-lathe production and putting it with all other special work into a division of its own. Here it was united with the manufacture of regular and special equipment for our customers, and the building of tools, fixtures, and special machines for ourselves.

Thus everything irregular, spasmodic, and unpredictable was assigned to this special department, while steady machine production, on a more easily predetermined program, was concentrated in the section devoted to machine building. By working toward regularity and routine we hoped to reach conditions under which a considerable element of the overhead expense would become unnecessary.

Meanwhile there was another element conducing to irregularity. While the department could be run under general orders to produce a given number of machines per week, there could be no foreknowledge far in advance as to how many of them should be "2¼-inch machines," how many of them "3-inch ma-

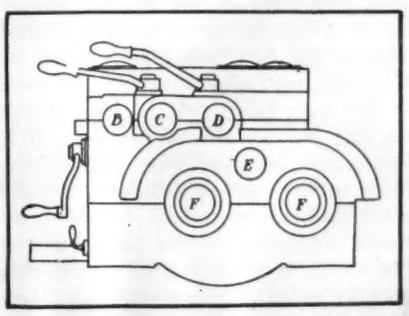


FIG. 2—END ELEVATION OF DOUBLE SPINDLE HEADSTOCK

chines" and how many of them "double spindles"—these being the shop terms for the three styles in which the turret lathe was built. These machines were designed on the same general plan, and many of the parts in the 2¼-inch and 3-inch machines interchanged, but this was not true to any extent of the double-spindle turret lathe.

Machines Are Redesigned

A redesign of these three types was therefore undertaken to make them as nearly alike as possible, not only in their separate individual parts but also in their unit assemblies. This redesign was so successful that three basic sizes (or, with varying equipment, seven types in all) are assembled from the same parts with the following variety of major castings: 2 headstocks, 2 spindles, 2 beds, 2 turret slides, 3 turrets, and a few minor parts.

For a 2¼-inch headstock, with its higher spindle speed, the driving-gear ratio at *A* in Fig. 3 is altered, and a spindle with a different nose used. About the only criticism which could be directed against this redesign relates to using the powerful 3-inch drive on this 2¼-inch machine. It is much more powerful than is needed. But it is cheaper to make it alike and heavier, than lighter and different. Besides bringing the design of the machines together, the variety of parts in a given machine was greatly reduced. For instance, the design of the friction clutches on the different shafts was made the same. These are of the multiple-disk type. On the fast-running shafts with light torque, thicker and fewer hardened disks are used. On the slow-moving shafts with heavy torque, more and thinner ones are employed. All of this work practically cut in half the total number of kinds of parts to be dealt with.

The three basic sizes of machine having thus been unified in design, they became for all practical purposes one machine. The workmen scarcely know which size they are working on. They may be put through the assembly in groups of 15 or 20 each, or mixed together indiscriminately, without making a break in the routine of manufacture. This unification of the product was in reality a return, in a more developed way, to the first principles followed by Mr. Hartness who confined the work of the shop from 1892 to 1905 to one machine and one size of machine. It is needless to say that now, as then, the range of the machine built was carefully determined to cover the largest practicable percentage of the lathe work of the world, in order to give the broadest possible market for our intentionally restricted line.

Shop departments can be arranged either by process or by product. By the former plan all milling is done in a milling department, all drilling in a drilling department, all turning in a lathe department, etc. The argument for this is that by specializing on a given operation the foreman and his assistants become highly skilled in that work, doing it better and more cheaply than if they were concerned with a wide range of operations. The disadvantages lie chiefly in the constant movement of work from department to department, with its consequent slowing up of the work flow, division of responsibility, and difficulty of control.

Arranging the departments by product means that any individual piece stays in a single department until it is completely finished, ready for assembly. Such a department may be arranged to complete all parts of a similar nature, no matter where found in the machine, or all parts of whatever nature belonging to a given assembly unit of the machine. Both arrangements are to be found in automobile manufacture, where departmentalization by product is the rule in the larger and more successful shops. In this turret-lathe shop it was decided to departmentalize by product, primarily on the basis of the unit assembly, and only secondarily by similarity of parts. This arrangement was expected to prove strongest where the method by process was weakest; and its single disadvantage, lack of specialization by the foreman, was found to be illusory to a great extent.

The space available was 275 x 100 feet divided by columns lengthwise, as shown in Fig. 3, into 10-foot aisles, and crosswise into 25-foot bays. Experience with this shop leads us to believe that about this width of shop and width of cross-bays are ideal for medium-sized manufacture. The columns should, however, be spaced to give 20-foot aisles, as has been done in our later construction. The later buildings are also increased in width to 120 feet. Such shops may be built to any length by the magnitude of the production. The building is of steel-frame, sawtooth-roof construction and fireproof. The general arrangement is indicated in Fig. 3. The incoming material passes north up a long aisle extending the full length of the shop In the aisle on the left, next to the west wall, are the bins in which the raw material is stored. The center of the shop is occupied by the various manufacturing departments, after which comes the equipment and final testing of the machines.

How Material Flows

In successive aisles toward the east, and running for practically the full length of the manufacturing section, come the inspection benches, storage of finished parts, sub-assemblies and line assembly. From the line assembly the finished machines detour into the bay for equipment and final testing, and out into the painting and shipping room. The flow of material is thus from the southwest corner north to the appropriate department, thence directly east across the width of the shop to final inspection and storage, thence to subassembly and line assembly. The line assembly moves north on the eastern side and out at the northeast.

How the Bed Travels

Let us follow the progress of the bed. The arrangement of the machines for its department is shown in Fig. 9. The castings are stored at the west of the aisle. From there they are taken first to an Ingersoll mill, where the pads on the bottom are milled off, after which the bed is turned over and the cross-rails milled. Space for a second mill is left as shown by the dotted lines in Fig. 9. The bed now goes to the roughing planer, and thence to the horizontal boring and milling machine. The next location is the radial drill. Here the bed is held by the V's or special fixtures, and light sectional jigs are used for the drilling.

The machining is now nearly completed, and the bed rests for a time on the floor. It then goes to the finishing planer to scrape the V's. This is a final machining to remove all "wind" so that the hand scraper's job shall be one of finishing the surface rather than of removing material. The bed is now mounted on wheels instead of its regular legs, and is ready to start up the assembly line—of which more later. The important things to observe are the permanently mounted fixtures (adjustable for the two styles of bed), the simplicity of the operations, and the unvarying routine of the procedure. The department is under the foreman of the line assembly, but as a matter of fact it is practically self-managing.

The "saddles" (turret slides) and turrets, machined in the next department, are also large pieces. The layout is shown in Fig. 5. When completed these parts shift north to the appropriate point in the subassembly aisle. The apron and turret-slide parts in general comprise main castings, gears, shafts and studs, and milled steel parts. The layout for this department, Fig. 8, shows three lines of tools. The upper or northern line, comprising mills, driller, etc., takes care of the castings and milled steel parts. The lower or southern line, composed of turret lathes, machines the shaft, studs, and gears which, however, pass north at the end through the Fellows gear shaper and the Bry-

ant internal grinder on their way to the inspection bench and the parts storage. The central line is composed of miscellaneous machines common to the other two.

Affords Ease of Control

This arrangement exemplifies the subdivision of the departments on the basis of the character of the parts machined. room. From there it goes to the subassembly and line assembly.

The head-gear department is laid out as shown in Fig. 7, and the shaft and spindle department as in Fig. 6. A pair of Fay automatic lathes are kept set up with an adjustable, but standard, equipment for the shafts. The succeeding spline millers, drills, and grinders are plainly indicated. The head-castings etc. for finishing operations, and thence to the subassembly, on a trolley beam around the north end of the finished parts storage. Let us now return to the assembly line, following the order shown in Fig. 3. The different operations are so divided as to give about equal lengths to each. At the first station the wheels are put on. At station 2 the V's are scraped. At station 3 the turret slide

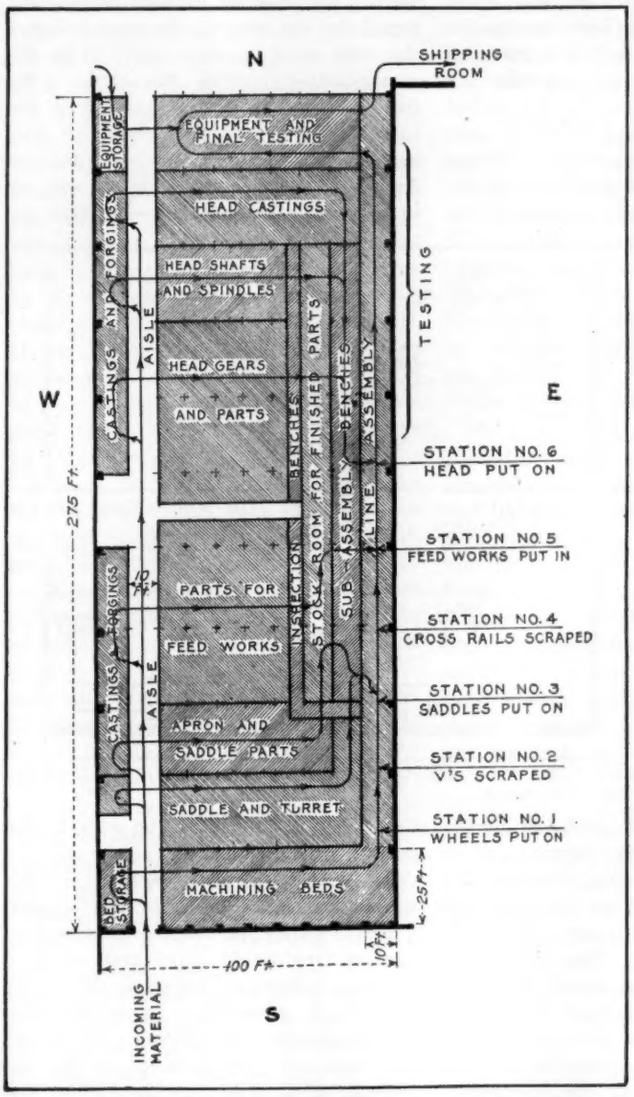


FIG. 3—GENERAL ARRANGEMENT OF A TURRET LATHE SHOP

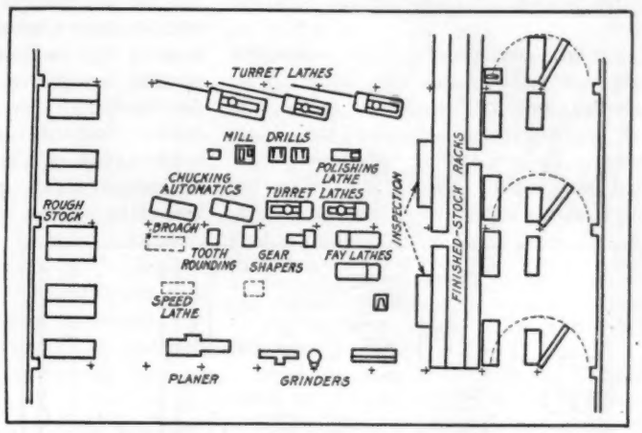


FIG. 4—LAYOUT OF DEPARTMENT FOR MACHINING FEED WORKS PARTS

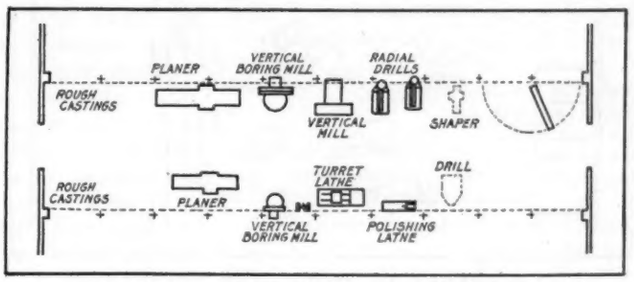


FIG. 5—LAYOUT OF DEPARTMENT FOR TURRET AND SADDLE MACHINERY

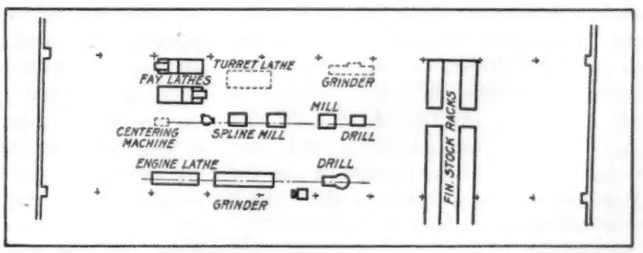


FIG. 6—LAYOUT OF SHAFT AND SPINDLE DEPARTMENT

A similar case is shown in Fig. 5 ,where the turrets go east along the south side, and the turret slides east along the north side. In this way the flow of every part can be made to approximate a straightforward progress from west to east, with only occasional and minor divagations. This makes for ease of control and orderliness in the department. The layout of the department for machining feed-works parts is as shown in Fig. 4. Here again we have separate lines of machines for different classes of work, as indicated on the layout. From the machines the work is handed over to the inspection bench and thence to the stock department is interesting for its specialized equipment. The bases are planed on the bottom, then caps and bases are milled for the joint. After drilling together, the united headstock goes to a special boring machine, where all the shaft and spindle holes are rough and finish bored, reamed, faced, and tapped at one setting. The machine for this work costs much less than a standard boring machine and jig for the same purpose, and finishes all the holes at once instead of one at a time. This is an example of the economies possible in continuous production.

The head then goes to the radial drill, is put on, scraped to the V's, and the turret rescraped to the slide. At station 4 the crossrails for the cross-sliding head are scraped, using special devices to bring them at right angles with and parallel to the V's.

Machines Are Run-In

At station 5 the oil pump and piping and the feed work are put in. Next the headstock is placed on the machine, and it is now complete. There are still, however, five stations remaining before reaching the department for equipment and final testing. Advantage is taken of this space to give the machines a

final "run-in," which is done by belting them to motors overhead. This running-in is opposite to the head assembly and is under the care of that group. Any difficulties or needed adjustments are taken care of here. The machines are mounted on their legs here, equipped with motors if required, and then with regular or special equipment as may have been ordered. Finally they are put through standard alignment and operative tests.

Certain departments and operations are not included in this layout. Steel storage and cutting-off are taken care of in one department for the whole plant. So are casting, snagging, cleaning, and filling. These come before the parts arrive in the turret-lathe shop. After the machines leave the equipment and testing department they go to a painting, boxing, and shipping room common to all of the products. Automatic screw-machine products are taken care of in one department for the whole shop; and so, finally, is the hardening and heat treating. This latter operation is the only one making a break in the orderly flow of work through the shop.

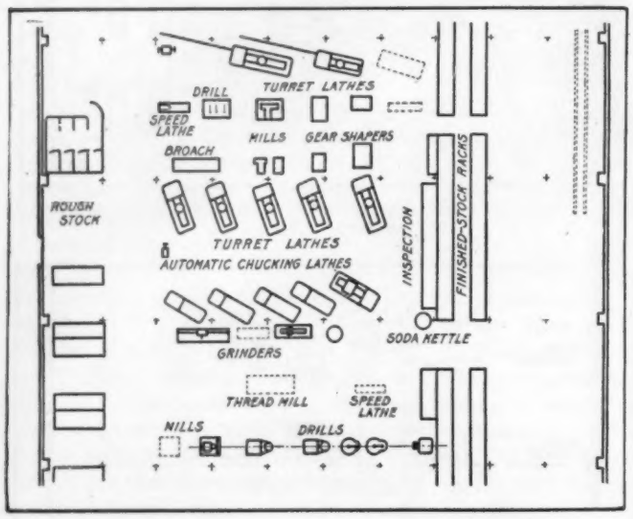


FIG. 7—LAYOUT OF HEAD GEAR DEPARTMENT

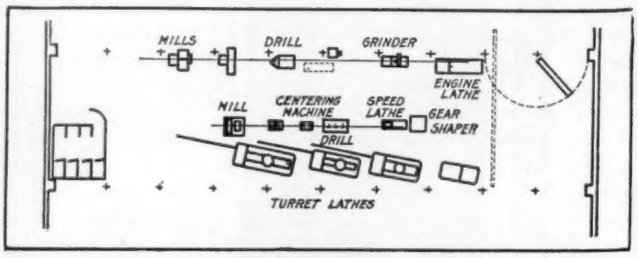


FIG. 8—LAYOUT OF DEPARTMENT FOR MACHINING APRON AND TURRET SLIDE PARTS

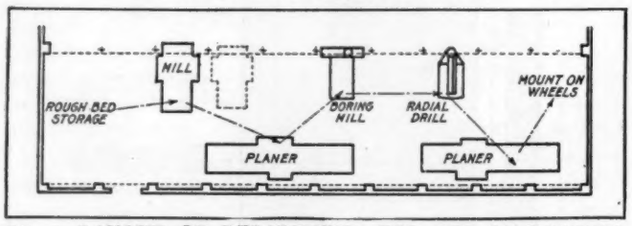


FIG. 9—LAYOUT OF DEPARTMENT FOR BED MACHINERY

Ordering System Is Effective

The orders for parts are routed through this shop in a predetermined and effective course, but without any machinery of control. The rough and finished-parts stock rooms are kept supplied with an adequate store of parts to prevent any holdup in production, but there is no stockkeeper assigned to them; nor does this lack of special supervision result in unbalanced or undesirably large inventories or in unexpected shortages. These desirable features are attained by a "program" scheme of ordering and routing all parts except the main castings.

Each order is nominally of a sufficient size to furnish enough for a two-month's production. An order for a given part is thus placed in the shop every two months, or six times a year. The second period of the year (March and April) is an exact duplicate of January and February. A standard routing of all the parts passing through a given department may thus be laid out, from machine to machine, and duplicated for the next period and the next, and so on for the six periods of the year. The routing was originally laid out on the basis of full production of five machines per day, on special sheets provided for this work.

This standard routing is made upon the basis of our previous years of experience in speeds and feeds, and is arranged to put the orders through in the minimum time, with sufficient waits between operations to insure against trouble. All long waits, however, are eliminated, and with them the expensive items of storage space and idle capital for inactive stock. The ideal aimed at has been that of a small, fast-flowing stream of work instead of a large, sluggish one. Further insurance against trouble is offered by reckoning on only about 80 per cent of the theoretical machine capacity. The margin takes care of breakdowns, breaking in new operators, poor stock, etc. There is the additional possibility of running overtime in an emergency.

The original laying out of the schedule is a matter of juggling, judgment, and experience. A successful solution implies a minimum of equipment, a minimum of floor area, a minimum inventory of work in process, a maximum rate of progress of the work, and a simple and easily comprehended standard of achievement for the department. The finished routing schedule gives a starting date, repeated every two months, for each part. These starting dates, with other data, are recorded on a card. If castings or forgings are required, the date on which they are to be ordered is also given, and on that date the foreman is held responsible for making a requisition on the purchasing department.

How Stocks Are Maintained

A wide range of rates of production is provided for—from 3 to 30 per week. The rate of production is determined by the general management, and the shop takes its information from the corresponding line on the card. Now there is supposed to be carried in the rough-stock bins a full half-lot of castings or forgings in reserve. The first step of the foreman is to count this reserve stock. If it is below normal for the scheduled production, he adds to the normal order enough to make up the deficit. If it is above normal, he decreases his normal order by this amount.

This half-lot in reserve is insurance against trouble. It takes care of poor castings, delayed deliveries, spoiled work, etc. It is particularly important from the standpoint of starting the orders on time. If only half of a lot has arrived, it is still possible to put the work into the shop by drawing on this reserve. Nervous tension, frantic struggling, and despairing clutching at straws must be eliminated from the production schedule and concentrated on the problem of getting started on time.

The amount of rough stock ordered is thus determined by the scheduled rate of production and an actual count of the reserve supply. The finished-stock room is run on the same principle. When a new lot arrives in the stock room it is supposed to find a half-lot in reserve waiting there. At the earlier period of starting the lot there should be a correspondingly larger amount, and this amount is set down on the card. If the reserve stock is low, the foreman in-

creases the normal lot to make up the deficit. If it is in excess, he correspondingly decreases his order.

Stock Is Counted Repeatedly

No stock-room records are kept. Both rough stock and finished stock get a complete count six times a year, and a better knowledge is obtained than is possible with all the chances for error in the clerical work of the perpetual inventory. The stock is under continuous control. Orders go out from the main office to work on a production basis of 30 or 75 machines a month, or whatever it may be, and automatically the stock adjusts itself to this production. Change in scale of production is made easy by the provision of a reserve of half a lot in both rough stock and finished parts. The scheduled production on the card may be increased a step a month, or decreased at the same rate. If the proper changes in labor capacity are made to correspond, the adjustment of size of lots and size of stock takes place easily with the half-lot reserve as a balance wheel.

This is startingly different from the old order of things with us, in which shortened production left us with a large stock, and increased production with an insufficient one. There is the accompanying financial advantage that the amount tied up in rough stock, work in process, and finished parts is automatically adjusted to the scale of production. It leaves for special decision only the major financial problem of how much shall be tied up in finished machines.

As there are no stock records there is no stockkeeper. The foreman of each department oversees the putting in and taking out of the rough stock. The inspector, located beside the stock room, O. K.'s the finished work and places it in the proper bins. The bins are located opposite the point where the parts are finished and close to the point where they are assembled. One of the assembly men, detailed for the purpose, steps in and lays a group of parts on the top of the rack opposite the man who needs them when he needs them. It is possible to look down the aisle of the stock room twenty times and see a man in it only once.

Confusion Is Avoided

This scheme of management is essentially a decentralized one. By keeping the work completely within the department from rough stock to finished stock, we avoid the necessity for detailed control of its movements, particularly with reference to interdepartmental relations. These are minimized, relating almost entirely to hardening operations. Roaming about the shop becomes unnecessary, the telephone falls into disuse, clerks disappear, and a hundred chances for confusion are dissolved. The foreman is bounded only by his production orders and his schedule. Within these limits he is king of his territory, with full power given to him and full responsibility demanded of him. His job is his own in a way that is never possible under the other plan of departmentalization and other schemes of management.

Mention was made of the fact that only about 80 per cent of full production per machine was reckoned with in laying out the schedule. This will ordinarily leave some idle time. When such idle time appears imminent on a machine, the foreman goes shopping for work in the special or other departments. The service parts furnish convenient "knitting work." Since it is difficult to predict the call for repair parts, this branch of the business is handled in the old-fashioned way. The foreman can usually pick up something here to fill in his idle time.

He is provided, finally, with a definite yardstick with which to measure the efficiency of his department. The schedule requires a certain total number of hours for a given rate of output. If he requires more, he is not up to standard. If less, his management may be highly commended. In general, he will have to stick closely to the definite routing prescribed by the schedule to maintain full production. On lessened production, with fewer men but a full complement of equipment, more latitude is allowed.

Cost Accounting Is Simplified

Little need for detail cost accounting is apparent. The cost of the machines can be determined sufficiently for price-setting purposes by reckoning on the overall operations of the shop—so much spent for steel, castings, forgings, etc. per month, so much for labor, and so much for overhead and fixed charges. This, divided by the output, gives a good cost per machine, because the department is run on an even basis. This simplified method of cost keeping is not the least of the advantages of this method of management; and the author believes it to be far more accurate—as well as far les sexpensive—than the elaborate addition of the labor, material, and overhead for every one of the several hundred separate parts. The standard schedule presupposes standard costs with a given average labor rate and market cost of material. This standard cost derived from the standard schedule, set against the actual cost obtained as above, gives another gage of achievement.

The plant now is working on a straight hourly-rate basis. The effectiveness of workmen and foremen can in general be gaged by their ability to keep to schedule, and their rate of pay can be adjusted accordingly. The plan would, however, seem to be adaptable to premium payment, and perhaps still more so to piece-work or bonus payment. It would seem to be especially suited to the group-bonus scheme, as the whole organization is divided up into small groups, each of which has a definite section of the work assigned to it and within it control.

In the foregoing mass of details some of the principles involved are brought out clearly, others only incidentally. It may be well to recapitulate then here.

1 **Standardization of Product.** This is the first necessary step. It is the prime requirement of successful manufacture that a design of the product be settled upon which will give a wide market over a considerable period of years. This is the definite predetermined simplification of the problem which makes the solution possible.

2 **A Separate Manufacturing Equipment and Organization for the Product.**

3 **Departmentalization by Product Rather Than by Process.** There is nothing new in this. It is the plan of the high-production automobile shop. The novelty lies in adapting it to a low scale of production—in our case to an extreme low point of fifteen per month.

4 **A Recurrent Production Schedule or Program.** It is this feature which permits the adaptation to small production, and also makes possible the measurement of efficiency and the simplification in control and cost accounting.

5 **Concentration of Plant.** Principles 3 and 4 can operate to cut down machine and building investment for a given production, or to increase production for a given investment. It is worth while to decrease "the great open spaces" in a shop, if only to keep the work from taking root and going to seed in them.

6 **Minimized Transportation.**

7 **Disturbing and Difficult Factors Confined to Purchasing** So far as possible, strenuous effort is made to have material ready to start on time. Then confusion is banished from the shop.

8 **Visual Control of the Work Itself, Instead of Remote Control by Records.** It is less than 100 feet from raw material to finished machine. Within this short distance the work is to be found (except while being heat treated). It cannot escape. The foreman has it under his eye until it is assembled and rolls into the shipping room. In control by records some superexecutive functionary sits at a desk and pores over cards and slips of paper. A few hours of this and the eyes glaze and the judgment falters. It is better to deal with things rather than with the records of things.

9 **Control by Orders Instead of by Records.** Records are always late. Direct the thing before it happens and save some tons of paper and miles of scribbling. And yet success in giving proper orders was only possible because we had kept records for years. Perhaps it is best to consider records as a necessary evil, to be discarded as soon as possible.

10 **Automatic Control of Inventories.**

This is important. It is the commonest of errors to put into inventories resources which belong in dividends.

11 **Cost Figures by Analyzing Total rather than by Totaling Innumerable Details.** Cheaper and surer.

12 **A Plain Job for Every Man and Full Responsibility with It.** A man can do more, and prove that he has done it, thus establishing a basis for increased earnings.

13 And lastly: **Don't Try to Overcome Difficulties—Avoid Them.**

The general shop layout here described was devised by Henry S. Beal, assistant general manager of the Jones & Lamson Machine Co. The details of the machine arrangement and the arrangement of the production schedule are the work of Louis Hronek, assistant superintendent. George A. Perry, chief engineer, was responsible for the redesign of the product on which this method of manufacture is based, and for the mechanical details of the production scheme. Credit is also due to the personnel of the Fay lathe department, who tried out many of these methods under more difficult conditions.

Training the Modern Foundry Apprentice

(*Concluded from Page* 1572)

foundry executive to take charge of all foundry apprentices. We have returned to the first method. The special instructor, handling apprentices under several different foremen, must be a high grade diplomat as well as a first class foundryman, else there will be constant friction. We have not located such a paragon and believe that by keeping in close touch with our foremen and leaving details of shop training and discipline to him, good results will follow.

The apprentice is hired by the educational department and remains under its general supervision to the end of his course. This, with the close personal touch kept by the educational department with both apprentice and foreman, and the active interest of the management in the system, is sufficient guarantee against irresponsible activity on the part of an irritable foreman. The movement of apprentices from one department to another is handled by the educational department, but in this matter, wherever the nominal control, it must be understood that co-operation is the key to any successful training program. A foreman or superintendent who is not in sympathy with the movement can nullify all efforts in this direction if permitted to do so.

For this reason, it is necessary that the management take a firm stand at the start. The training program should be put on the same basis as production, a duty required of the various departments by the management. If this essential step is not taken, no amount of effort or expense on the part of the most competent educational department will avail. The tendency is to satisfy the demands of the management in exact proportion to the urgency of such requirements.

Our interest is in training competent molders and coremakers, not foremen and superintendents. If every firm shoulders this burden of training boys to be good workmen, enough of foreman material will develop in a natural way, and may be trained by other educational agencies in the principles of foremanship. The technical schools turn out many men qualified to take charge of foundry work after they have received some practical training. Some of these men already have had some years of practical experience in the trade before taking up the technical course.

So much has been written in recent years about the proper methods of instruction in the shops, by men who have extended experience to lend weight to their opinions, that the reader is likely to be confused in his attempt to coordinate and make use of the information. However, analysis of the data brings out the main thought that the apprentice should be taught basic principles and to apply them to his work in a rational manner, considering the reasons for each step. Teaching by arbitrary methods is decried as unscientific and inefficient.

If every boy were capable of learning and successfully applying basic principles, we should need few foremen or superintendents; merely a few clerks to tally the output of these super-mechanics. Unfortunately, we must deal with humanity as we find it. Authorities on the subject of mentality tell us that each person enters the world with certain mental possibilities. These, like his physical gifts, may or may not be developed to the full in later life, but they are as fixed as his stature. No amount of effort can push the individual beyond these limits, which are determined almost entirely by heredity. Mentality tests on hundreds of thousands of subjects have established that in a given hundred average persons, only four or five will possess first class reasoning powers, and perhaps 40 per cent will be capable of acquiring knowledge in varying degrees by strictly rational processes.

Intelligence is only one of the activities of the mind, and its operations are influenced by other elements, such as the emotions, and physical condition. Therefore, it follows that even with careful selection by mental and physical tests and by questioning, some poor selections will be made. We do not wish to be understood as decrying the effort to train boys to approach their work in a rational manner. This should be aimed at in all cases, but the instructor who knows human nature as it is, will understand that results will range all the way from near perfection to practical failure. But of the average 10 boys who finish a trade, one or two will develop into first class mechanics who understand the principles of their trade, five or six who will become fair average workmen, using some reason in their daily work, and two or three who may know the manual operations of the trade, but will always have to be under close supervision because they are too unintelligent or too mentally inert to do their own thinking. Therefore, it is useless to discuss apprenticeship training as though the foreman or the instructor were at fault if every apprentice did not develop into a foreman or superintendent or even into a first class workman.

It is to be hoped that the publication of various training programs will stimulate interest in this vital matter of training men for the foundry. The author also would offer the suggestion that the National Founders' association might work out a training scheme with suitable texts along the lines followed by the National Metal Trades association in their apprenticeship training scheme.

Screw Machine Products Gain in Output

The department of commerce announces that, according to the data collected at the biennial census of manufactures, 1923, establishments engaged primarily in the manufacture of screw machine products reported a total output valued at $39,110,582, an increase of 113 per cent as compared with 1921, the last preceding census year. The products of screw machines are numerous and varied, including machine screws of all kinds, bolts, studs, rods, rivets, collars, pins, rolls, and washers.

In addition, screw machine products are manufactured to a considerable extent as secondary products by establishments engaged primarily in other industries. The value of such commodities thus made outside the industry proper in 1921 was $3,533,575, an amount equal to 19.2 per cent of the total value of products reported for the industry as classified.

To Cold Draw Steel

Installation of a cold-drawn steel plant is under way at the Toledo, O., works of the Champion Spark Plug Co. Ground was broken last week for the construction of a 1-story building which will house sufficient equipment to insure 60 tons of cold drawn steel a day and will provide a 3000-ton storage capacity.

Large Uses of Steel In Small Ways

EVERY small boy who goes on exciting adventures after school must be armed with a sturdy pocket knife; but the small boy has no monopoly on this universal and handy implement. A pocket knife is almost as much a part of the average man's equipment as his watch, and production statistics in the United States indicate that every alternate male throughout the country carries or owns one.

Approximately 35 manufacturing plants in this country are engaged in producing pocket knives. These plants vary greatly in size. One of the largest produced 132,000 dozen knives in 1919 and a manufacturer in close touch with the entire trade estimates the country's production for 1923 as 13,500,000. Government statistics for 1919 show that 5000 people were engaged in the manufacture of pocket knives, the total value of which during that year amounted to $10,690,000.

On the assumption that the average life of a knife is two years and that the production at present is 15,000,000 a year, some 30,000,000 knives in useful condition are constantly in existence in this country, or nearly one to every three people including men, women and children.

Steel enters largely into the manufacture of these knives. Almost universally the blades and springs are of steel. The lining is usually brass. The bolsters are frequently steel, but often nickel silver, and the hinge pins are either steel or nickel silver. At one of the largest knife manufacturing plants the steel parts used in a miscellaneous assortment of 20 styles were gathered and weighed, and the result showed that a little over two pounds of steel is used for every dozen knives. On this basis some 2,500,000 pounds or 1250 tons of steel enter directly into the country's annual production of pocket knives.

Pocket Knives

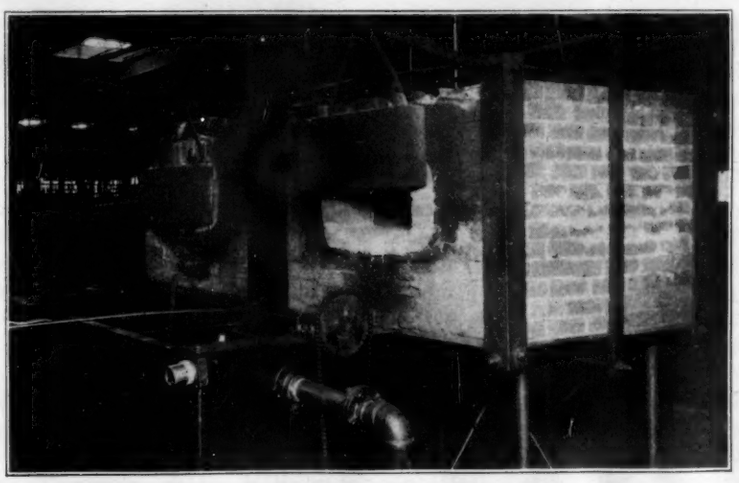
THIS is the twenty-sixth of a series of articles dealing with some of the thousands of obscure uses of steel which in the aggregate go a long way toward absorbing the great American tonnage, and in proclaiming steel the universal metal. The first article on "Corsets" appeared Nov. 22. Other articles were "Pins," Dec. 6; "Pens," Dec. 20; "Cotton Ties," Jan. 17; "Steel Wool," Jan. 31; "Toys," Feb. 14; "License Plates," Feb. 28; "Spinning Rings and Travelers," March 13; "Hypodermic Needles," March 27; "Card Clothing," April 10; "Shoe Steel," April 24; "Tie Plates," May 8; "Crushed Steel," May 22; "Tacks," June 5; "Skates," June 19; "Knives and Forks," July 3; "Phonograph Needles," July 17; "Surgical Instruments," July 31; "Fence Posts," Aug. 14; "Needles," Aug. 28; "Eyeglass Cases," Sept. 18; "Golf Clubs," Oct. 2; "Fishing Tackle," Oct. 16; "Mechanical Pencils," Oct. 30; "Dental Drills," Nov. 13, "Burial Caskets," Nov. 27.

This steel varies in quality from common sheet steel to high grade chrome-vanadium alloy steel. For high grade knives the blade steel is almost always imported. The reason that foreign steel is preferred by manufacturers is stated by one authority to be because of its more uniform action in heat treatment.

Except for the cheapest knives, blade steel must come up to rather rigid requirements, and it is common practice to specify an elastic limit of 35,000 to 40,000 pounds per square inch in the bars bought for this purpose.

Just as the styles of pocket knives vary, so do methods of manufacture. Blades, of course, form the vital parts of any knife. These are usually made from rods which are cold cut to length, heated in small individual furnaces, and then brought to shape under power hammers. At one plant the heated bars are first drawn out under helve hammers, then die-stamped and trimmed on board hammers and finally cold-straightened under gang presses. From this point the finishing in nearly all plants consists of heat treating and grinding.

Heat treating for higher grade knives is an important operation and many plants have elaborate departments for this purpose. For different steel for varied uses heat treatment varies and for this reason it is the usual practice to have many small ovens rather than few large ones. For normal carbon steel the blades are heated to between 1350 and 1400 degrees Fahr. The method of handling the small blades in and out of the heating and tempering devices naturally differs in a plant of large production from that of the small plant, but generally speaking production methods, while adopted for nearly all other operations have not yet invaded the heat treating department. One very large plant which has automatic machinery for grinding and polishing knife blades has hand operation throughout the heat treating department. The small knife blades are placed on trays about 100 to a tray and placed in the furnace. When the proper temperature has been reached, the entire tray is taken out and becomes a link in an endless belt arrangement which operates in a steel tank full of oil which is kept at the desired



HEAT TREATMENT OF THE STEEL BLADES IS AN IMPORTANT STEP IN POCKET KNIFE PRODUCTION. THE BLADES ARE HEATED IN SMALL OVENS AND QUENCHED IN OIL

temperature through constant pumping.

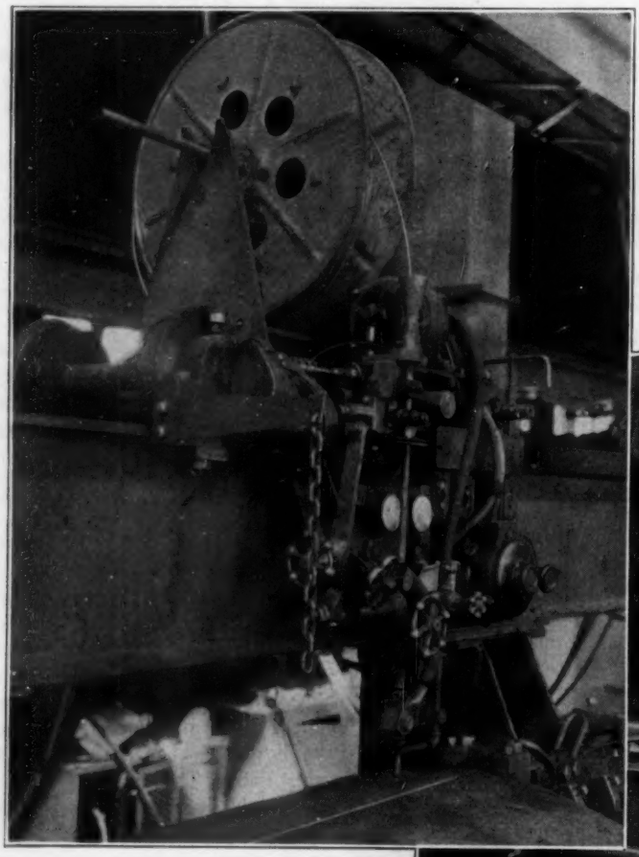
Progress in automatic grinding machinery has been rapid during the last few years and now in plants of even moderate size the heat treated blades are fed into machines from which they emerge almost completely ground. On all high grade work the actual sharpening is a hand operation. This is usually done on small wheels covered with walrus hide and coated with glue and fine emery.

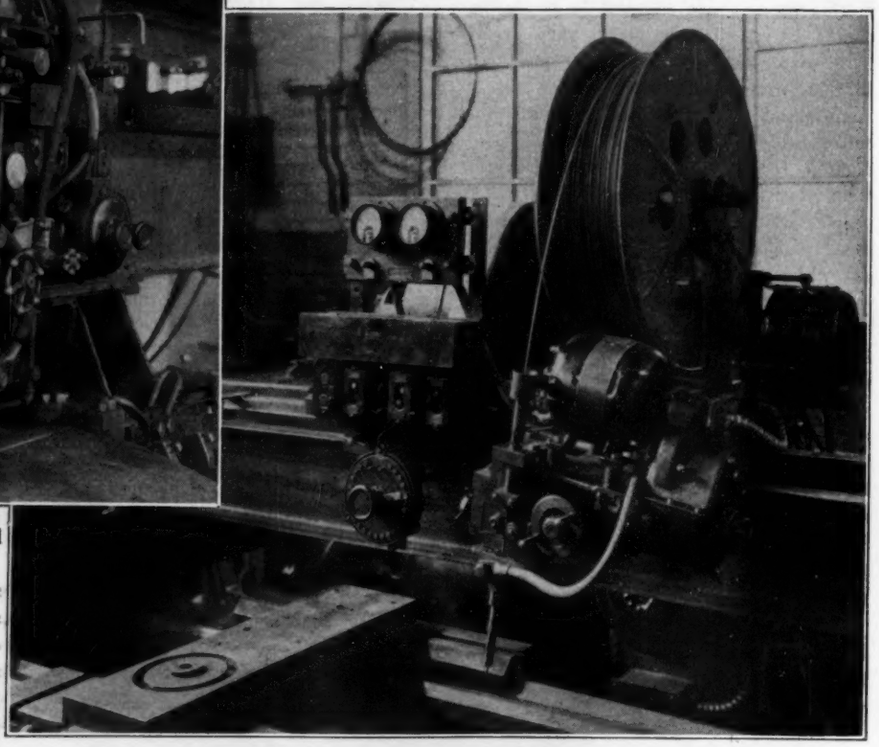
Other parts of the knife are more simply made. The brass linings are stamped from sheet brass on gang stamping machines, frequently an automatic process. The springs are formed in automatic machines from coil wire. The pins and rivets are frequently screw machine products. Handles of bone, wood, or other material are formed on woodworking machines. The parts are hand assembled to form the completed article, and curiously enough it is usually girls who do the assembling for this essentially masculine article.

A new 35-inch 3-high blooming mill recently was placed in operation at the steelworks division of the Timken Roller Bearing Co., Canton, O. It will have a capacity of 1200 tons daily. Three 2-hole soaking pits which can be operated independently, were installed in addition to a 500-horsepower boiler.

New Machine Makes Arc Welds Automatically

To simplify the welding process in production work where similar welds are made repeatedly on similar articles, the General Electric Co., Schenectady, N. Y. has designed a self-contained travel carriage for the automatic arc welding of straight seams. This carriage which is shown in the accompanying illustrations, consists of an automatic welding head, control, travel motor and wire reel support, all mounted on a suitable framework and provided with wheels for rolling along a track. The welding head and control are mounted on the apron of the carriage and feed the electrode wire from a reel to the arc. This reel is carried by supports attached to the carriage frame.





(Left) Close-up view of carriage of automatic arc welding machine.

(Below) Another model of the same machine showing the welding head

In operation, the travel carriage is so controlled electrically by means of push buttons that, once the work is set up ready for welding, the operator may throw the system to the automatic position, thus confining the control of both welding head and travel motor to one push button. Control of the welding head and travel motor is so interlocked that when the starting button is pushed the arc is established automatically and simultaneously with the starting of the travel motor. Should the arc fail for any reason, the travel motor will stop without overtravel. The arc will re-establish itself and the travel motor will re-start, all without attention from the operator, thus insuring a continuously welded seam. An adjustable time limit switch stops the motor at the end of the weld and the carriage is returned to the starting position either by hand, electrically or by manipulating the push buttons. The carriage can be provided with an oscillator to be used when welding heavy plate.

Approximate dimensions of the unit are: Length, 3 feet 6 inches; width from front of apron to back of carriage, 2 feet 7 inches; height above track, 2 feet 6 inches; and weight, 800 pounds. Some applications for the device are welding longitudinal seams in sheet steel tanks such as gasoline tanks, range boilers and transformer tanks, and in building up locomotive guide rods and other worn flat surfaces of all kinds.

Advantages claimed for the automatic process of arc welding are economy of electrical energy; increased speed; better physical properties, including strength, solidity, ductility, uniformity and continuity; the production of certain welds impossible by hand welding; and the general elimination of the personal element.

Discuss Diversity of Problems

Mechanical Engineers Consider Many Phases of Fuel, Power, Aeronautics, Ordnance, Management and Machine Shop Practice—Storing and Handling of Liquid Fuel Receives Detailed Attention—Taylor's Work Reviewed

ADDITIONAL evidence of the effectiveness of the policy of preparing its programs in accordance with the work of its professional divisions was revealed at the forty-fifth annual meeting of the American Society of Mechanical Engineers held last week in New York. The papers presented under the auspices of the fuels, power, machine shop, material handling, national defense and aeronautic divisions were especially well received.

Another factor which contributed materially to the success of the program was the scheduling of papers so that ample time was allowed for discussion. To accomplish this, each session was restricted to three papers or at the most four, thus permitting from 40 to 50 minutes for presenting and discussing each.

Following the precedent established recently lectures were delivered at the close of the technical sessions on Tuesday and Thursday. The first was by Dr. Julian D. Sears, United States geological survey, Washington, on the petroleum situation and the second by P. W. Bridgeman, Harvard university, Cambridge, Mass., on the properties of matter under high pressure.

Preceding the annual business meeting Wednesday afternoon, Walter M. McFarland presented to the society a bust of Rear Admiral Melville. Secretary Calvin W. Rice presented the annual report of the council after which President Fred R. Low, editor of *Power*, presented awards for the best paper submitted in 1924.

During the week many visitors took advantage of excursions to power plants and other points of interest in the metropolitan district. The most popular trip was to the hangar of the navy department at Lakehurst, N. J., on Friday, when about 350 members and guests inspected the dirigibles LOS ANGELES and SHENANDOAH.

The usual smoker heretofore held on Monday evening was abandoned in favor of an "open house" at the Engineers Societies building. Dr. Livington Farrand, president Cornell university, Ithaca, N. Y., was the principal speaker at the annual dinner held at Hotel Astor, Wednesday evening.

Study Problems of Machine Shop Practice

THE keen interest displayed by members of the society in the problems of machine shop practice again was demonstrated at the Tuesday afternoon session, when each of three papers was discussed by many speakers. F. O. Hoagland, Reed-Prentice Co., Worcester, Mass., presided and contributed much to the success of the meeting by drawing out comment from the many engineers in attendance qualified to speak on machine shop practice.

In a paper on the effect of inaccuracy of spacing on the strength of gear teeth, Lloyd J. Franklin, San Bernardino Ice & Precooling Plant, San Bernardino, Cal. and Charles H. Smith, Stanford university, Cal., reported the results of tests recently conducted to supplement the work done by Prof. Guido Marx in 1912. In presenting the paper, Mr. Smith explained that at pitch-line velocities of from 0 to 1000 feet per minute, gears whose inaccuracies of spacing do not exceed 0.001 inch will carry twice the load of those having inaccuracies of 0.006 inch.

In the discussion of this paper, little criticism was made of the results, but it was suggested that certain irregularities in the methods of testing and in the equipment employed may have affected the findings. H. E. Eberhardt, Gould & Eberhardt, Newark, N. J. and Luther D. Burlingame, Brown & Sharpe Mfg. Co., Providence, R. I., commented on these features of the paper. R. E. Flanders, Jones & Lamson Machine Co, Springfield, Vt., emphasized the importance of the information provided by the tests and stated that a more definite method of expressing inaccuracies is desirable. He also suggested that the abrasion of gear teeth not in perfect mesh may have something to do with their period of life before failure. B. H. Blood, Pratt & Whitney Co., Hartford, Conn., cited a number of important factors influencing the smooth running of gears, stating that perfect tooth form is of little avail if the spacing, concentricity and depth of cut are not accurate.

Important data were contributed to the meager literature of spring design by Joseph Kaye Wood, consulting engineer, New York, in a paper entitled "Mechanical Springs". Mr. Wood defined mechanical springs, classified them and established load-deflection-rate formulas for tension and torsion. From these data formulas for safe loads and deflections were derived in general terms containing constants to enable them to be applied to any given stress method, material or form. He contended that the general or collective method of treating mechanical springs affords a means of avoiding much of the complexity which now surrounds the subject of design. Mr. Rockefeller, J. Chatillon Sons. Co., Newark, N. J., presented a written discussion in which he outlined some of the problems encountered in making springs for scales.

A paper on ruling line standards by Herbert B. Lewis, Brown & Sharpe Mfg. Co., Providence, R. I. and C. G. Peters, bureau of standards, Washington, was presented by Mr. Lewis, who described a method of producing line standards free from measurable error by applying light interference and an end measuring machine which he pictured. In reply to question it was brought out by Mr. Lewis that in measuring gages with this machine the sense of pressure of the gage against the points of the measuring machine is the determining factor in the accuracy of the result. This precipiated a most interesting discussion on the ability of skilled workmen to sense minute changes in workmen by the "feel" of the gage when passed between the points.

One speaker who had worked with ordnance gages during the war period, presented data on the accuracy possible when flat, cylindrical and objects of other shapes are measured in this way. Mr. Blood cited experience showing that the method is reliable when applied to laboratory or fine tool work. Expert toolworkers, he said become so

proficient that they can detect differences of less than 0.00005 inch in the diameter of measured pieces. A third speaker emphasized the need of keeping the surface of a piece to be measured free from dust and contamination. He perscribed washing in gasoline and rubbing with a common soft rubber eraser.

In conclusion Dr. Bond, Stevens Institute of Technology, Hoboken, N. J., related a number of incidents in the early efforts to establish linear standards in the United States. He described the bringing of yard and meter standards from Europe and the care with which these were divided, the yard first into feet, the feet then into inches, etc. Accuracy was sought by comparing each foot with the other two and each inch with the other 35 and correcting for error until each unit was as nearly perfect as the methods then employed permitted.

Ralph E. Flanders, Jones & Lampson Machine Co., Springfield, Vt., presented a paper entitled "Design, Manufacture and Production Control of a Standard Machine." Mr. Flanders described the method by which difficulties in the manufacture and production of certain machines were avoided by the company with which he is identified. He used as an example the manufacture of a flat turret lathe and described the shop manufacturing processes, routing and stock room control. This paper was presented practically in full in last week's issue of IRON TRADE REVIEW.

Surveys Status of Nation's Power Requirements

FUEL and power resources of the country were exhaustively covered in two addresses presented Tuesday afternoon and evening. In the first, Dr. Julias B. Sears, administrative geologist, United States geological survey, Washington, discussed "Engineering and the American Petroleum Situation." Dr. Sears discussed the factors in the oil situation which in many respects closely parallels the conditions existing in the coal industry a year or so ago. He pointed out the demoralization which occurs in times of overproduction and suggested remedies for stabilizing the industry. He indicated the growth of demand, listed the volume of oil reserves and the possibilities of increasing the percentage of recovery from existing oil pools. He stresses the need for conservation and greater efficiency.

Tuesday evening, prior to the report of the tellers of election and the introduction of President Elect Durand, Fred R. Low, editor of *Power* and retiring president of the society, presented an address on the present status of power.

He stated that it is only within comparatively recent times that the burden of supporting the race has been transferred to power operative machinery. Today, he said, power operated machinery is doing in the United States alone more work than could be performed by all the able-bodied men in the world working like slaves from sunrise to sunset.

The total amount of power used, or even of the prime-mover capacity installed in the country is impossible of close estimate, declared Mr. Low. From a survey made jointly by the *Electrical World* and *Power*, there are installed in the mills and factories of the United States about 34,000,000 horsepower; in the central electric stations, 24,600,000 horsepower. There is some duplication on account of the fact that the industrial plant figures include motors, current to drive which is purchased from the central station. The combined installed capacity of prime movers may be guessed at about 45,000,000 horsepower.

"If these figures are correct," said Mr. Low, "there is installed for each unit of our population prime-mover capacity capable of generating about seven horsepower, and at our estimate of 2,000,000 foot pounds as a day's work for a man, this would be equivalent to the ability to produce for each man, woman and child of our population if they demanded it, physical service equivalent to that which could be rendered by 30 odd slaves."

Handling and Storing Oil in Industrial Plants

RECOGNITION of the problems involved in handling and storing fuel oil for industrial use was accorded in three independent technical sessions of the annual meeting. The first, held Tuesday morning with J. A. Shepard, Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., as chairman was devoted to the presentation and discussion of a paper entitled "The Storage and Handling of Fuel Oil in Industrial Plants," by C. G. Sheffield and H. H. Fleming, Standard Oil Co. of New Jersey. This paper was published practically in full in last week's issue of IRON TRADE REVIEW.

The second session, devoted to oil burning, was held Wednesday morning with E. H. Peabody, Peabody Engineering Corp., New York, in the chair. H. G. Donald, United States navy yard, Philadelphia, presented a paper on fuel oil burning in the navy, touching on the type of atomizer, combustion, draft, boilers, furnaces and refractories. The discussion drifted into the channels of classification and characteristics of oils.

Oil burning in industrial plants and central stations was discussed in a paper presented by Nathan E. Lewis, Babcock & Wilcox Co., New York. Mr. Lewis also commented on atomization, oil heaters, furnace volume and refractories. His reference to steam and mechanical atomizers stimulated a discussion on these methods which was participated in by several combustion enginers. Kinsley L. Martin, Engineer Co., New York, compared the two types of atomizers and presented as advantages of the steam jet the lower pressures used, the simplification of strainer problems, the avoiding of the necessity of frequent removal of the burners for cleaning, and wide flexibility.

Mr. Martin also brought up the question of refractories, which prompted Mr. Pellis, Corning Glass Works, Corning, N. Y., to relate his experience in cooling firebrick walls from the outside. He stated that with a furnace temperature of about 2700 degrees Fahr. and an outside temperature of about 400 degrees for 8-inch bricks, the outside surface could be cooled to 200 degrees by a slight agitation of the air playing on the brick wall. With an air current of 50 feet per second this temperature could be further reduced to 20 degrees above air temperature. However, additional movement of the air failed to further reduce the temperature of the external surface of the brick. It was found, he said, that the reduction of the temperature from 400 to 200 degrees outside made little impression on the temperature of the interior face of the brick, the change not being sufficient to register on an optical pyrometer.

J. C. Jefferson corroborated this statement and cited the case of the U. S. S. Leviathan on which a current of air introduced under the floor of the boilers has reduced the wear on refractories.

F. M. Gibson, American Sugar Re-

fining Co., Boston, warned against frightening the prospective user of fuel oil by giving the impression it is difficult to handle. He cited a number of factors which make oil advantageous for industrial use. In answer to a question, Mr. Martin stated that steam atomization requires from 1½ to 2 per cent of the steam generated. W. Trinks, Carnegie Institute of Technology, Pittsburgh, spoke briefly on the refractories requirements of open-hearth furnaces.

The hazards of industrial oil burning were described in a paper by H. E. Newell, National Board of Underwriters, New York. He discussed the flash point of various oils, the heating of oil in storage tanks, and the causes of oil fires. These causes, as determined from an investigation of 102 fires, are as follows:

	No. of fires	Per cent
Broken pipes	26	25.5
Broken and defective fittings and valves	12	11.7
Carelessness with valves	11	10.8
Overheated oil furnaces	7	6.9
Miscellaneous carelessness	7	6.9
Broken and defective burners and burner connections	5	4.9
Leaking pipes	5	4.9
Sparks or flames from oil furnaces	5	4.9
Explosions in furnaces	4	3.9
Clogging of pipes, obstructions to burners	4	3.9
Oil getting into air pipes	3	2.9
Defective or improperly installed tanks	3	2.9
Explosions in tanks	2	2.0
Oil soot ignited in flue	1	1.0
Data lacking	7	6.9
Total	102	100.0

The discussion ranged from the corrosion of oil pipes to the comparative hazards of fuel oil and gasoline. In reply to a question regarding corrosion of underground pipes, it was stated and generally agreed that the oil has no effect and that corrosion must come from electrolysis or some other extraneous factor. One speaker cited an instance where cinders used for back filling gave off acids when subjected to moisture and eventually caused the leakage of a cast iron pipe line.

Mr. Gibson spoke of the practice of placing sand around supply lines in concrete trenches, stating that he preferred to have the lines free for the prompt inspection of leaks. The sand, he said, tends to delay the discovery of leaks until a considerable amount of oil has seeped out.

W. Polakov, Walter N. Polakov. Inc., New York, commented on the local restrictions placed on the storage of fuel oil in certain communities, stating that in one instance it was difficult to gain permission to install tankage for fuel oil, when across the street gasoline was stored in wooden barrels. This brought forth the statement from Mr. Newell that he considers fuel oil more hazardous than naphtha or gasoline. When asked to amplify this opinion, he cited a case in New Jersey where a fire started by distillate spread to a fuel oil tank which boiled over three times and caused a million dollar loss in a roofing tar factory. This spreading pool of burning oil, he explained, surrounded a tank of naphtha, and in the course of the fire it was possible to pump out two thirds of the naphtha and save the tank. He pointed to the boiling quality of fuel oil as one of its dangers in the case of a large volume of the oil catching fire.

Although the subject of safety was discussed in a number of the professional sessions, a separate meeting held Wednesday morning was devoted to "Mechanical Design for Safety." This session was held under the auspices of the A. S. M. E. committee on safety codes, the American Society of Safety Engineers and the National Safety council.

Engineers Pursue Peacetime Study of Ordnance

AT THE business session on Wednesday, Secretary Calvin W. Rice commented on the interest being taken by the American Society of Mechanical Engineers in cooperating with the government on national defense. That the activity of the society in this direction is increasing is clearly shown by the tendency in the programs of the past two years. Last week the outstanding session on subjects of this character was held Wednesday morning under the auspices of the national defense division of the society.

Col. Dwight M. Davis, assistant secretary of war, delivered a brief address on engineering problems of national defense. Colonel Davis declared many engineering problems of national defense lie at the very apex of management engineering. Two basic ideas underlie the plan of National defense. The first is that industrial preparedness is not preparedness for war; it is assurance against war. The second is that if we are ever forced into war, the burdens of war must be equally distributed. The two fundametnal problems confronting the nations at war, he said, are the man power problem and the munitions problem.

Continuing, Colonel Davis said:

"Through the national defense act we wisely place the munitions problem under a civilian, the assistant secretary of war. His task is to so plan that every industry, every natural resource, every science and profession, every business man and laborer may meet most effectively the demands the country may make in insuring her defenses. It is a matter of management engineering on a supreme scale.

"The war department therefore must work out an organization and plans for its operation and control in time of war. It must select a personnel to man the organization; making sure that round pegs are selected for round holes and square pegs for square ones. If our organization is properly engineered, if the selection of big business men to keep the positions is wisely made, our army will enter the conflict under no preventable handicap from the industrial side. Otherwise, we must expect to return to many of the difficulties which were encountered during the world war.

"Basically the organization which we are evolving must be viewed from the aspects of requirements, resources to meet these requirements, and machinery and personnel to make it effective. The mere task of computing the requirements and finished products is a large one, although it is but the first and simplest step in the problem.

"After the requirements have been computed they must be translated into terms intelligible to industry. We must know what they mean in terms of raw materials, machine tools, gages, shop equipment, power, labor, transportation and everything else that industry is to be called upon to furnish to meet our demands. Each of these is a distinct problem, many of them of great preplexity."

J. B. Rose, United States army, Washington, D. C., outlined mechanical and engineering features involved iin the design of a 75-millimeter field gun. Col. T. C. Dickson, ordnance department, United States army, Watertown, Mass. presented a paper on "X-Ray Examination of Metals at the Watertown Arsenal". Col Dickson outlined new developments in the use of the X-Ray equipment which has been employed at Watertown for several years. He described the results that have been obtained through the use of 280,000-volt apparatus to determine defects in steel castings with a view to redesigning the patterns to eliminate defects.

Perhaps the most informative paper of the session was that presented by F. C. Langenberg, metallurgist, Watertown arsenal, Watertown, Mass. Doctor Langenberg described recent developments in investigating the strength and structure of metals used for gun construction, illustrating his remarks by lantern slides. Owing to the character of the information presented, his remarks were held strictly confidential.

Show Visualizes Scope of Power

Third Exposition of Power and Mechanical Engineering Includes Exhibits of 375 Manufacturers—Power Generating, Distributing and Utilizing Equipment Is Demonstrated—Progress in Transmission Reflected in Show

IN THE brief period of three years, the annual power show, formally known as the National Exposition of power and Mechanical Engineering has become one of the leading exhibitions of industrial equipment, vieing with the railway, foundry and steel treating shows in number of exhibitors and in attendance. The third exposition, held last week at Grand Central Palace, New York, embraced displays by 375 companies and covered three floors instead of two as in 1922 and 1923. The attendance was above 70,000.

In addition to the commercial exhibits were educational displays, the most interesting of which was maintained under the auspices of the National Museum of Engineering and Industry. Numerous prints of old drawings of machinery and copies of early patent papers were shown. Another exhibit consisted of historical prints and photographs relating to the pioneer days of the machine tool industry in New England. Most of these records were loaned by Prof. Joseph W. Roe, New York university, New York.

The exhibits included practically every device required for generating and distributing power, ranging from coal handling equipment, stokers, refractories, combustion systems, boilers and accessories, power piping, valves, transmission, ball and roller bearings, meters and instruments, and machine tools.

Motion pictures of operations in several branches of industry were shown daily and lectures on power plant equipment, machine tools and material handling were delivered during the week.

Show Transmission Equipment and Machine Tools

WHILE the exhibition of machine tools was far from representative of the metalworking industry, the dozen or more displays attracted as much attention as any other group at the show, probably because most of the tools were in operation.

The Rockford Machine Tool Co., Rockford, Ill., demonstrated a vertical drilling machine equipped with a combination drill table and vise manufactured by the Modern Machine Tool Co., Jackson, Mich. and using chucks, drills and reamers made by the McCroskey Tool Co., Meadville, Pa. In a nearby booth Andrew C. Campbell, Inc., Bridgeport, Conn., operated its nibbling machine on sheet stock, cutting internal or external outlines to template or scribed lines. A reciprocating punch actuated by a cam permits rapid nibbling and a stop pin on the punch prevents taking too much stock at one stroke and provides a uniform feed.

The Hartness-type screw thread comparator, a turret lathe and other products were demonstrated by the Jones & Lamson Machine Co., Springfield, Vt. A compact machine embracing the functions of a lathe, milling machine and drill press was displayed by the Triplex Machine Tool Co., 50 Church street, New York. This three-purpose action is obtained by moving the head upward along a radial arm to an angular or vertical position.

One of the largest machine tool exhibits was that of the Pratt & Whitney Co., Hartford, Conn., which included a full line of bench machine tool equipment, the 13-inch precision and production lathe first exhibited at the New Haven and Boston shows last fall, and gear cutter and scores of taps, dies and other small tools. Drill presses and milling machines with a complement of gages, taps and small tools constituted the joint exhibit of the Hanson-Whitney Machine Co. and the Hanson Tap & Gauge Co., both of Hartford, Conn. Bench lathes, dial gages and milling and filing machines were demonstrated by the B. C. Ames Co., Waltham, Mass.

Cutting off machines, usually in evidence at most metalworking shows, were demonstrated by two manufacturers. The 6-inch machine shown by the Henry G. Thompson & Son Co., New Haven, Conn., is somewhat different from many units in that a band saw is used, which is controlled by a positive feed which predetermines the cutting load imposed on the teeth of the blade. The Racine Tool & Machine Co., Racine, Wis., demonstrated several types of metal cutting saws.

Motor driven drills and grinders were displayed attractively by the James J. Clark Electric Co., Louisville, Ky., and a pipe threading machine was operated by the Toledo Pipe Threading Machine Co., Toledo, O., which also displayed stocks and dies. Electric rivet heaters were demonstrated by the American Car & Foundry Co., New York. Unusual attention was accorded a mechanical blacksmith's hammer operated at the booth of the Blacker Engineering Co., New York. A wide range of testing machines and auxiliary equipment was shown by the Tinius Olsen Testing Machine Co., Philadelphia.

Manufacturers of transmission equipment were exceedingly well represented at the show, particularly makers of speed reduction gear sets, clutches, leather belting, chain drives, flexible couplings and ball bearings. Among the most elaborate displays of reducing gears were those of the Cleveland Worm Gear Co., Cleveland; Falk Corp., Milwaukee; Foote Bros. Gear & Machine Co., Chicago; and W. A. Jones Foundry & Machine Co., Chicago. A large exhibit of gears, sprockets, chains and universal joints was maintained by the Boston Gear Works, Norfolk Downs, Mass. A wide variety of cut gears was displayed by the Philadelphia Gear Works, Philadelphia.

The tendency toward the wider application of ball and roller bearings was emphasized by the large number of exhibitors of this equipment and by the variety of types shown. Among the manufacturers participating were Marlin Rockwell Corp., Jamestown, N. Y.; Fafnir Bearing Co., New Britain, Conn.; N. K. A. Ball & Disk Bearing Co.; New Departure Mfg. Co., Bristol, Conn.; Nicetown Ball Bearing Co., Philadelphia; Norma-Hoffman Bearings Corp., Long Island City, N. Y.; Orange Bearing Co., Orange, N. J.; S. K. F. Industries, Inc., New York; Standard Steel & Bearings, Inc., Plainville, Conn.; Strom Ball Bearing Mfg. Co., Chicago; Transmission Ball Bearing Co., Buffalo; and Wollmar Engineering Corp., New York.

Among other exhibitors of transmission equipment were the following: Flexible couplings, Bartlett Hayward Co., Baltimore; Smith & Serrill, Newark, N. J.; and Thomas Flexible Coupling Co., Warren, Pa. Pulleys, clutches, etc.: W.

Mason Volney Co., Providence, R. I. and Hill Clutch Machine & Foundry Co., Cleveland. Chains drives, Morse Chain Co., Ithaca, N. Y.; Ramsey Chain Co., Albany, N. Y.; Boig & Hill, Inc., New York; and H. & O. Chain Co., South Norwalk, Conn.

Welding equipment was exhibited by the Torchweld Equipment Co., Chicago and the Wilson Welder & Metals Co., Inc., Hoboken, N. J.

Material handling equipment was shown by several exhibitors, most for specific purposes. The only general purpose apparatus was demonstrated by the Yale & Towne Mfg. Co., Stamford, Conn. Included in this exhibit were several types of industrial trucks, electric chain hoists and geared and differential blocks.

National Blow Pipe & Copper Works, Inc., Chicago, has increased its capitalization from $500 to $50,000.

Exhibits Emphasize Importance of Refractories

ASIDE from the exhibits devoted to boilers, stokers and power house accessories, none appeared in greater number than those of fire brick and refractories. As a rule manufacturers of these materials are satisfied to simply display a few samples of their product, but in this show the care taken in arranging products attractively was in evidence in the majority of the booths. This was true not only of the exhibitors of fire brick and arches, but also of those who demonstrated refractory cement. In almost every case the materials had actually been employed to demonstrate their application in industrial use.

Fire brick and refractory cement were shown in various applications for boiler furnaces and industrial furnaces. Among the exhibitors were the Bernitz Furnace Appliance Co., Boston; Carborundum Co., Niagara Falls, N. Y.; Celite Products Co., Chicago; M. H. Detrick Co., Chicago; Drake Non-Clinkering Furnace Block Co., New York; A. P. Green Fire Brick Co., Mexico, Mo.; Jointless Fire Brick Co., Chicago; King Refractories Co., Inc., Buffalo; Keystone Refractories Co., New York; McLeod & Henry Co., Troy, N. Y.; Mack Engineering & Supply Co., New York; Maphite Sales Corp., St. Louis; Norton Co., Worcester, Mass.; Queen's Run Refractories Co., Inc., Lock Haven, Pa.; and Quigley Furnace Specialties Co., New York.

That modern industrial and boiler furnace construction involves better protection against loss of heat was emphasized by the unusually complete exhibits of insulating material. The displays of the Armstrong Cork & Insulation Co., Pittsburgh; Philip Carey Co., Cincinnati; Insulating Products Corp., New York; and the Korfund Co., Inc., New York embraced not only insulating materials for furnaces and power piping, but in the case of two exhibitors, cork plates for machinery foundations to deaden vibration.

Broad applications of oil and powdered coal were evidenced by the many exhibits of combustion apparatus for these fuels. Illustrations of the complete equipment required for preparing storing, distributing and burning pulverized coal were afforded by the large exhibits of the Aero Pulverizer Co., New York; American Pulverizer Co., St. Louis; Baker Dunbar Co., Cleveland; Erie City Iron Works, Erie, Pa; Fuller Lehigh Co., Fullerton, Pa; Lopulco Co., New York; and the Raymond Bros. Impact Pulverizer Co., Chicago.

Many of the manufacturers of power house instruments added to the attractiveness of their exhibits this year by mounting them on instrument boards. Valves and fittings were much in evidence.

Perhaps the most striking displays this year are those by the copper, brass and nickel manufacturers. Copper and brass tubing, strips and sheets were utilized by several manufacturers to form the backgrounds of their displays.

Among the exhibits of miscellaneous equipment which attracted much attention was that of the Irving Iron Works Co., Long Island City, New York. Iron grating for floors, stair treads and subway and power house use were shown in various applications.

Another exhibit of unusual interest was that of the Hollow Ball Co., Baltimore. This company exhibited samples of aluminum, bronze and steel hollow balls in various stages of manufacture, showing the methods by which the tubing is formed into spherical shape. Dozens of uses for hollow balls were indicated in the finished products exhibited.

Fuel Merger Completed

Birmingham, Ala., Dec. 9.—Merging of the Pratt Consolidated Coal Co. and the Alabama By-Products Corp. has been completed and the business will be carried on under the name of the Alabama By-Products Corp., the directors of which are M. W. Bush, H. Hammond, A. P. Bush, H. L. Morrow, G. B. McCormack, Erskine Ramsay and Carr McCormack. The officers are G. B. McCormack, chairman of the board; Morris W. Bush, president; Horace Hammond, vice president; A. P. Bush, vice president; Carr McCormack, vice president; H. L. Morrow, treasurer; J. A. Shook, secretary and H. M. Cowart, assistant secretary and assistant treasurer.

The Koppers Co. which is building 25 additional by-product ovens at the plant of the Alabama By-Products Corp., making a total of 100, is making efforts to complete the new ovens by March 1. The date originally set was April 15 to May 1.

Form Harnischfeger Corp. in Reorganization

The Harnischfeger Corp. is the new name adopted by the Pawling & Harnischfeger Co., Milwaukee, which on Nov. 28 observed the fortieth anniversary of the association of the late Alonzo Pawling and Henry Harnischfeger, the latter still being at head of the big enterprise, in a small machine shop business. The capitalization of $3,000,000 also has been increased to $6,000,000, of which $4,000,000 is common and the remainder preferred shares. The increase merely represents investment in plant and equipment already made.

Mr. Harnischfeger was guest of honor at a banquet at the Wisconsin club on Dec. 1 to celebrate his anniversary. Two hundred Milwaukee business men and Pawling and Harnischfeger, executive and supervisory employes were present. The development of the business in 40 years from a 1-room shop to a plant covering 34 acres, with 15 shop buildings, at Thirty-eighth and National avenues, was described.

Officers of the new Harnischfeger Corp. are the same as those of the old company, as follows: President and treasurer, Henry Harnischfeger; vice president and general manager, A. G. Henricks; vice president, Walter Harnischfeger; secretary, Rene V. Schleinitz.

The Davis & Furber Machine Co., North Andover, Mass., has increased its capital from $410,000 to $2,200,000 of $100 par value stock, by capitalizing $1,790,000 of its surplus. New stock to the amount of $1,618,000 is to be distributed to stockholders of record Dec. 1 as a 400 per cent stock divided.

French Foundrymen Meet at Paris

Committee Is Formed To Study the Standardization of Patterns—Several Exchange Papers Are Presented by Foreign Associations—Next Meeting Will Be Held in Liege, Belgium, in 1925

BY VINCENT DELPORT
European Manager, Iron Trade Review

USE of special grades of pig iron, scientific study of molding sands, defects of castings, standardization of patterns and study of production costs were among the questions discussed at the fourth annual meeting of the Association Technique de Fonderie de France, held at the Conservatoire National des Arts et Matiers, at Paris, Nov. 21-23. The French government was represented at the meeting which also was attended by foundrymen from Italy, Grand-Duchy of Luxemburg, Spain and Switzerland. Many papers were presented, several being contributed by the foundrymen's associations of America, Great Britain and Belgium.

The opening session took place Nov. 21 and was presided over by M. Dufour, president of the Syndicat General des Fondeurs de France. Emile Ramas, president of the Association Technique de Fonderie de France, extended the greetings from his association. This session was devoted to the study of special grades of pig iron and the first paper was read by M. Lamberton, president of the commission which was formed for the purpose of examining this subject. The paper was the report of the commission. It was ascertained that an important tonnage of special grades of pig iron can be produced in France. Test pieces have given a tensile strength of about 25 kilograms per square millimeter. The author of the report said that the use of a mixer would eliminate lack of homogeneity in special pig iron. M. Brull, professor at the Ecole Centrale des Arts et Manufactures and at the Foundry School said that the advantages of the mixer are more or less theoretical.

More Than Analysis Involved

The exchange paper of the Institute of British Foundrymen, prepared by A. Campion, Glasgow, Scotland, discussed factors that influence the resistance of pig iron. The author pointed out that the characteristics of a catsing depend not only on its analysis, but also on the state of the components and the manner in which they are distributed.

M. Roehrich, commercial manager of the Union des Consommateurs des Produits Metallurgiques et Industriels, followed with a description of the special grades of pig iron obtained by the furnaces of Hagondange, in Lorraine, with ore containing as much as 0.11 per cent phosphorus. Jacques Varlet, foundry manager at the Societe Anonyme Metallurgique d'Esperance-Longdoz, at Saraing, Belgium, read a paper on the physical properties of special grades of pig iron. M. Varlet stated that the pig iron which was produced up to 1900 in small furnaces with cold blast was of a higher grade than the product of today.

In the discussion which followed, it was stated that the best rolls for the manufacture of sheets come from Germany and that they are made of semisteel. M. Dufour asked if semisteel would not be more homogeneous if it were produced in the converter. M. Brull said that the first melt should be made into ingots, these ingots broken up and remelted in the cupola, this process always giving good results. M. Dady, member of the commission studying special grades, stated that many founders in the Paris district obtain homogeneous semisteel without remelting, and that in his opinion it is dangerous to remelt in the cupola owing to risks of recarburization. M. Buffet, of the Societe Alsacienne, said that good semisteel could be obtained with as much as 35 per cent steel. The important matters are the proportion of total carbon and silicon, the temperature of the mold and the thickness of the castings.

At the second session on Friday afternoon E. V. Ronceray presided. M. Juppeau, general inspector of public education and official representative of the French government, read a communication on the use of X-rays to detect defects in castings. The first paper on the program was by R. P. Lemoine, professor at the Ecole Superieure de Fonderie on the subject of molding sands. This paper summarized the work that already has been done on the subject. In his conclusion the author discussed the methods of testing advised by the subcommittee of the American Foundrymen's association, stating that the tests in view of the possible use of a sand should be effected only on sands that are ready for use and that have already undergone a preparation. L. Deltour, a Belgian engineer, presented an exchange paper of the Belgian association, on the physical characteristics which contribute to the study of molding sands. M. Deltour studied the causes to which should be attributed the plasticity of sands. Professor Bertrand, who is a specialist in questions of geology, gave interesting details on the sands of the districts adjoining Paris.

Presents Exchange Paper

E. Ronceray presented the exchange paper contributed by the American Foundrymen's association on the effects of humidity, dust and argillaceous substances on the permeability of sands. This paper was prepared by R. F. Harrington, W. L. MacComb and A. Hosmer of the Hunt-Spiller Mfg. Co., Boston, Mass. No discussion followed, but it was stated that the subject was of great interest and the paper would be discussed at a later meeting of the French association. Vincent Delport, European manager of IRON TRADE REVIEW on behalf of the American Foundrymen's association, invited the French and Belgian associations to attend the international congress in the United States in 1926.

A. Tauflieb, consulting engineer, read a paper on an experimental process for the study of foundry sands. He referred to the work of B. Hanley and C. W. Holmes at the Paris congress in 1923, and said that practical foundrymen need less complicated means of investigation. The author has contrived a method of analysis which gives indications of the permeability and resistance of sands without a laboratory or a specialized chemist. Another communication on foundry sands was delivered by M. Saillot, foundry engineer, who recommended the use of green sands and also the study of sand deposits and their exploitation with proper care to prevent contamination with neighboring argillaceous sands.

On Nov. 22, the work of the congress was resumed with M. Damour representing the Comite des Forges,

taking the chair. This session was devoted to the study of defects of castings. The first paper, by A. Debar, inspector at the Ecole Superieire de Fonderie, related to the classification of defects. Henri Forichon, student at the foundry school read a paper on the confusion of defects and of their causes. He recommended that scrapped castings be carefully and systematically examined. J. Leonard then gave a few remarks on certain defects which often happen at the gate and risers, recommending ways and means to prevent these defects. P. Mazenot, student at the foundry school, related experiments which he made relating to the welding of chaplets.

P. Devaux, foundry engineer, studied the formation of blisters which, he said, are not always caused by an excess in the proportion of sulphur, but to the method of melting. Ivan Lamoureux, on behalf of the Belgian association, presented an exchange paper studying the molecular equilibrium in iron castings. Again in this paper and in the discussion that followed it was pointed out that test pieces, even when taken from the casting, do not give positive results.

In the afternoon, M. Thomas, foundry manager at the Citroen plants, was chairman. Louis Piedboeuf, engineer at Embourg-Liege, Belgium read a paper on defects caused by the presence of sulphides and oxides in pig iron. J. Masviel, professor for pattern making at the foundry school summarized an essay on the subject of standardization and it was resolved that a commission would be formed in order to study the question.

The last meeting of the congress took place on Nov. 23 with G. Masson, president of the Association Technique de Fonderie de Belgique, presiding. The morning was devoted to the study of production costs in the foundry. In closing the congress, Emile Ramas pointed out the importance of the work which had been done at this meeting and thanked the foreign associations which had contributed either by exchange papers or by taking part in the discussions. G. Masson extended an invitation for the congress to be held at Liege, Belgium, next year.

Convention Calendar

Dec. 8-13—Exposition of Invention. Engineering Societies' building, 29 West Thirty-ninth street, New York. Executive offices at 47 West Thirty-ninth street, New York.

Jan. 15-16—American Society for Steel Treating. Winter sectional meeting, Sinton hotel, Cincinnati. W. H. Eisenman, 4600 Prospect avenue, Cleveland, is secretary.

Feb. 24-27—American Concrete institute. Annual meeting in Chicago. Harvey Whipple, 1807 Grand boulevard, is secretary.

Societies News

PROVIDENCE, R. I., was chosen as the meeting place for the eighteenth annual convention of the American Institute of Chemical Engineers, which held its seventeenth convention at Pittsburgh last week. The 1925 meeting will be held during the week of June 22. Present officers of the institute were renamed for the coming year. They are as follows: President, C. L. Reese, vice presidents, M. K. Moore, H. S. Miner and A. H. White; secretary, J. C. Olsen; treasurer, F. E. Frerichs. New directors elected were Dr. E. R. Weidlein, H. C. Parmelee and F. C. Zeisberg.

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Alabama Manufacturers Meet

The annual convention of the Associated Industries of Alabama, formerly the Alabama Manufacturers' association, was held at Birmingham, Ala., Dec. 9. The organization has membership in 47 counties of the state, employs more than 130,000 persons and has a annual payroll of over $140,000,000.

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Coal Mine Operators Convene

The Coal Mining Institute of America held its two-day annual convention at the chamber of commerce, Pittsburgh, Dec. 4-5. A business session was held Thursday morning, a technical session in the afternoon and a banquet in the evening. The convention ended with inspection trips on Friday morning.

* * *

Urges National Public Works

L. W. Wallace, executive secretary of the American Engineering council, Washington, is making a month's speaking tour through the South and West. Addressing local engineering societies in many cities, Mr. Wallace will interpret the aims of the council, stressing the movement to establish a national department of public works.

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Corrosion Medal Is Presented

The Grasselli Medal was presented to Dr. B. D. Saklatwalla, general superintendent and a director of the Vanadium Corp. of America, Bridgeville, Pa., at a dinner of the Society of Chemical Industry in the Chemists' Club, New York, Dec. 5. The medal, presented by Dr. William H. Nichols, president of the General Chemical Co., is awarded yearly to the person submitting the best paper on corrosion resisting iron and steel.

Extensive Improvements Made by Bethlehem

New York, Dec. 9.—The Bethlehem Steel Co. is operating at about 70 per cent of capacity compared with about 40 per cent last summer, according to a statement by Eugene G. Grace, president of the company. Mr. Grace said that the effect of the improvements in the company's plants is already noticeable in manufacturing costs and in earnings. He said further:

"The Bethlehem Steel Co. has completed, at the cost of $6,000,000, the remodeling of the coke-making equipment at its Lackawanna plant. The new equipment gives Lackawanna a coke-making capacity of 100,000 tons a month which is near the maximum required to operate its blast furnaces at capacity.

"The new and modernized equipment at Lackawanna will represent a large annual saving to the company, not only in production and efficiency, but also in the removal of purchasing problems. The new ovens will make coke in 12 hours as against 18 to 20 hours required in the process formerly used. They give the company the advantage of reclaiming all the by-products of coke, including fertilizer, gas, lubricating oils, tar and pigment used in the manufacture of coal tar dyes.

"The addition of the new coke ovens marks an important step in the modernization and expansion of the Bethlehem Steel Co.'s Lackawanna plant. There has also been completed at the Lackawanna plant the rehabilitation of the plate, blooming and roughing mills. These mills have been completely rebuilt and equipped throughout with electric drive replacing the older steam and hydraulic power.

"One of the most important changes in the Lackawanna plant has been a complete modernizing of the power and heating equipment. Boiler plants, steam engines, hydraulic and compressor machinery have been largely replaced with electric power, and waste gases from the new coke ovens and blast furnaces used for fuel in place of coal.

"The new structural mills at Lackawanna will probably be completed in the latter part of 1925. At Bethlehem's Cambria plant in Johnstown the Gautier bar department is being completely remodeled. A new blooming, billet and sheet bar mill has been completed at Cambria and is now in operation. The new tin plate plant at the Sparrows Point plant will be finished in 1925. This plant will include 12 mills and will add 50 per cent to Sparrows Point present tin plate capacity. The rail mill at Sparrows Point has been rebuilt, electrified and is now in operation.

"Bethlehem's plans for improvements at the various plants made at the time of purchasing the Lackawanna, Midvale and Cambria properties called for the expenditure of about $25,000,000. This money was taken from surplus. The program was later expanded, and with $30,000,000 of bonds sold to provide additional funds, it is likely that about $60,000,000 altogether will have been spent before the present work is completed. At that time Bethlehem will have an entirely modernized group of plants."

Offers New Idea in Management

Members of Taylor Society at Annual Meeting in New York Hear Outline of New Method—Management Principles of F. W. Taylor Are Reviewed —Discuss Problems of Production and Administration

AT A meeting of the Taylor society in New York last week management was presented a new mechanism—the first contribution of its kind since the Gantt idle time chart and the Gilbreth micro-motion study. This new principle was presented by John H. Williams, consulting engineer, New York in his paper on the "Need, Origin and Nature of Visual Control." A thorough explanatory presentation of the mechanism of such control was made by C. L. Barnum.

Mr. Williams explained that he was not attempting to visualize management or the decisions of management but is dealing with the *methods* of management. "Our purpose," Mr. Barnum explained, "is to provide a standardized technique through which the functions of management may be segregated into units small enough and sufficiently complete to be easily and separately dealt with, yet so related as to show the effect of changes made within each unit upon all other units. The same principles that are applied in visualizing mechanical engineering are applicable in management engineering."

The mechanism of visualization control includes two parts—a set of written instructions and a correlation chart, which is really the assembled drawing. Through it is visualized the relation of each part with the other. "This is not an 'ingenious chart,' " Mr. Barnum emphasized; "it is a mechanism based on definite principles." The talk, illustrated by slides, will be printed in a forthcoming issue of the *Bulletin* of the Taylor society.

Another outstanding phase of the meeting was the presentation of two papers on industrial psychology. The first was presented by W. V. Bingham, Personnel Research Federation, New York, who presided and outlined what industrial psychology asks of management. It was followed by a paper on the "Bases of Industrial Pschology," by Elton Mayo, industrial research department, Wharton school, University of Pennsylvania, who has been conducting interesting experiments in certain Philadelphia mills.

These two papers paved the way for a meeting of the minds between the manager and the industrial psychologist. Professor Mayo's paper gave to leaders in management a new concept as to what industrial psychology is and how it may be applied. As a result of these papers it is safe to assume that a new impetus will be given to the problem of industrial relations wtih the probable utilization of the psychological phases of such relations in a more effective way than heretofore.

The first day's session, a joint meeting of the Taylor society and the Management division of the A. S. M. E. on Thursday, Dec. 4, was distinguished by a representation of Frederick W. Taylor's paper on "Shop Management," originally presented to the A. S. M. E. in 1903. It is significant that the atmosphere has been cleared of the controversy of 10 years ago; the discussions of "Shop Management" showed a general mental attitude of acceptance of Taylor's principles and demonstrated the extent to which these principles have penetrated the business world. In the background of this paper were presented three clean-cut statements of current management practice in widely diversified types of industry.

Younger Men Grasp Idea

A meeting organized and conducted by the younger members demonstrated that the young men who are coming into management engineering work sense strongly the large problem presented by the varying ways in which executives and workers react, at the beginning, to the development of new management methods and the large part played by personality, tact, and common sense in the adaptation of sound principles and mechanisms of management to particular conditions. Taking part in this discussion were Morris L. Cooke, consulting engineer, Philadelphia; John E. O'Gara, R. H. Macy & Co., New York, and others.

Another series of meetings was devoted to the teaching of management. Men from a large number of engineering schools, universities and colleges in the eastern and central states gathered to discuss their mutual problems. "The Content of Courses in Management" was discussed in a joint paper by Joseph W. Roe, professor of industrial engineering, New York university, and Nathaniel G. Burleigh, professor of industrial organization and management, Amos Tuck school of Dartmouth college. In the afternoon session Henry S. Dennison, president, Dennison Mfg. Co., presented a paper on "What is Management?" before the same group of teachers of management, as a basis for consideration of the fundamental question in the minds of teachers; "What is the essential nature of management for which we endeavor to train young men?" As a result of these meetings a dinner session was held by the teachers and a program for future meetings outlined so that the work initiated by Mr. Feiss, the retiring president of the society, might be continued to become ultimately a vital factor in a better understanding by the teachers themselves, and closer cooperation and understanding by the teachers and the managers who consume the product which the teachers produce.

The last session was on sales management. The paper by Arthur Livingston, McKinney, Marsh & Cushing, Detroit, on "Market Analysis; Its Necessity; Its Technique" was significant in showing the analytic, engineering approach to the sales problem. It developed further that not only is the method of the production engineer valuable in the problems of distribution but that many of the successful application of this method in the field of selling are being made by men with production engineering experience.

"It would be hard to find in the history of the Taylor society any general meeting where so many significant papers have been presented or so enthusiastically received" said Percy Brown, the new president of the society. "The perplexity of management problems during the past year made the audience more receptive to the new contributions. The reaction especially to the paper by Mayo and by Williams show the development of a keener interest in psychological aspects of management and the necessity for a technique of over-all control."

That scientific management some day will double the real wage of labor was prophesied by Prof. Irving Fisher of Yale university. He spoke as follows:

"When scientific management is as universal as the telephone or newspaper I have little doubt that the welfare of labor will be doubled, in short that real wages will be twice as high as at present. In the end labor gains the most from so-called 'labor-saving devices.' Increased production means simply increased income to society and the wage earner usually profits the most in the end. Scientific management by which the bricklayer doubles or quadruples the number of bricks laid reduces the rent of brick houses. Scientific management which makes more shoes and clothes decreases

the real cost of shoes and clothes. Real wages consists of shoes and clothes and house shelter and food and the other things which labor consumes. Any device which facilitates their production tends to increase real wages. The proof that scientific management can more than double the average productivity is afforded by experience. In one instance the production of a plant was increased through scientific management from 5,000,000 to 17,000,000 units.

"Just as engineering, though originating in industry had to pass through the university to receive its highest scientific formulation and then hand back to industry thousands of educated young men to become engineers, so today industry with which scientific management began needs to hand over to our universities the task of educating young men in Taylor's principles."

The new president of the Taylor society is Percy S. Brown, Corona Typewriter Co., Groton, N. Y. The new vice presidents are Howard Coonley, Walworth Mfg. Co., Boston, and Henry P. Kendall, Boston. Edward W. Clark III, E. W. Clark & Co., Philadelphia, was elected treasurer. Nathaniel G. Burleigh, Amos Tuck school of Dartmouth college, Hanover, N. H., and C. Leslie Barnum, New York, were elected to the board of directors. Other members of the board, along with the officers, are Mary Van Kleeck, Russell Sage Foundation, New York, and William B. Ricketts, the Operadio Corp., Chicago. Dr. Harlow S. Person, 29 West Thirty-ninth street, New York, is managing director of the society.

Bender Welding & Machine Co., Inc., Montgomery, Ala., has decreased its capital stock from $50,000 to $30,000.

Obituaries

WILLIAM DETTE, well known figure in the pig iron and ferromanganese trades, died suddenly of heart failure at his home in New York, Dec. 2. Mr. Dette was aged 55 and apparently was in unusually good physical condition. He had just returned from a month's vacation at his country home in Litchfield, Conn. He originally started in the pig iron business with Rogers Brown & Co., at Buffalo. Later he went into the pig iron business at Philadelphia as William Dette & Co. In 1903 Mr. Dette joined the organization of Crocker Bros., New York, and in 1906 became a partner in that organization in which connection he continued at the time of his death. Mr. Dette had charge of some of the principal activities of Crocker Bros., and was closely connected with the operations of the Woodstock Iron Co. and the La-Follette Iron Co.

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LeRoy A. Tallman, construction engineer associated with Booth & Flinn, Ltd., Pittsburgh, died recently at his home in Malba, L. I., N. Y.

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Charles W. White, 57 years, president of the Heintz Art Metal Works, Buffalo, N. Y., died at his home there Dec. 2. He had been connected also with the jewelry manufacturing business.

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Frank Gustaf Fernstrum, active head for a half century of the Menominee Boiler Works, Menominee, Mich., died Nov. 21. His sons, John E., Benjamin A., and Herbert W. Fernstrum are connected with the business.

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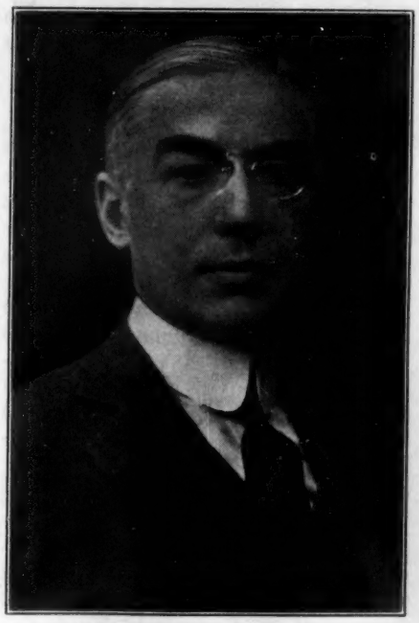
William D. Carter, operator of the Canisteo Iron Works, died recently in Canisteo, N. Y., at the age of 75 years.



WILLIAM DETTE

The Canisteo works had been established by his grandfather and now is being carried on by his sons.

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George Thorburn McIntosh, founder and formerly connected with the McIntosh-Huntington Hardware Co., Cleveland, which later was sold to the Leutkemeyer Co., died Dec. 4 at his home in Cleveland Heights, O., at the age of 75 years.

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Reuben N. Stern, 48, president of the A. Stern Iron & Steel Co., Chicago, died Dec. 1 of heart disease.

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John A. Krumme, 84 years old, formerly vice president of the John A. McGowan Co., Cincinnati, steam pump manufacturer, died at his home in that city, Dec. 4. Death followed a long illness. Until his retirement four years ago, Mr. Krumme had been connected with the company for more than 40 years. He was forced to retire because of his ill health.

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W. Lucien Scaife, aged 71, a former manufacturer of Pittsburgh, died in his home in that city Dec. 3. He formerly was chairman of the board of directors of the Scaife Foundry & Machine Co., Pittsburgh, and was one of the first trustees of Carnegie Institute of Technology. He was also on the board of the Carnegie Hero Fund commission, secretary of the Educational Fund commission, and a director of the University of Pittsburgh. Six years ago Mr. Scaife retired from active business and gave most of his time to philanthropic and educational endeavors. After receiving his elementary education in the public schools of Pittsburgh, he entered Yale university and graduated in 1873. He then went to Germany and attended the Frieberg University School of Mines. At the completion of his course he spent several years in the mining business in Nova Scotia.

George W. Baum

GEORGE W. BAUM, for many years a director of the Mackintosh-Hemphill Co., Pittsburgh, who died Nov. 26 at the age of 69 years, served as vice president of the company from 1911 to 1922, and had been a member of the executive committee for some years. A resolution recently adopted by the directors of the company read in part: "His direct and indirect associations with Mackintosh-Hemphill Co. have extended over a long period and he is one of the last ties which bind an earlier generation to the present organization. As a son-in-law of James Hemphill, he jealously guarded the old and worthy traditions of this company. We, his associates, of the board of directors and executive committee, wish to record our sincere sorrow and grief in the parting with a faithful and conscientious associate. We will miss his wise counsel and genial personality."

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

DOMINION SHEET METAL CORP., Hamilton, Ont., announces that plans have been completed for establishing of a plant in Montreal for the manufacture of galvanized sheets. Building operations will be started soon and it is proposed to have the plant in operation early next year. At the new plant it is proposed to use British steel in connection with Canadian labor, chemicals, zinc and other Canadian materials. The announcement is made as a result of a recent trip to England by A. T. Enlow, president of the Dominion Sheet Metal Corp., at which time an alliance was entered into between the John Lysaght, Ltd., the largest producer of black and galvanized sheets in England. It also has been reported that additional equipment will be installed in the Hamilton, Ont., works of the Dominion Sheet Metal Corp., to take care of the increasing demands of the Canadian market.

* * *

TWO buildings recently were started by the New Jersey Blower & Mfg. Co., 179 Ogden street, Newark, N. J. One is a 2-story, 40 x 100-foot plant and the other a 2-story 30 x 100-foot building. Stocks of fans for all industrial purposes will be carried in the new structures.

* * *

INCLUDED in recent contracts booked by the Austin Co., Cleveland, engineer and builder, are those of a 60 x 180-foot plant, 40 x 42-foot and 25 x 40-foot for the Clarke Chemical Co., Wickliffe, O., and a 2-story, 60 x 130-foot plant at Port Clinton, O., for the American Gypsum Co. The latter project involves 65 tons of structural steel.

* * *

PLANT and assets of the Metal Ball Co., Danbury, Conn., have been absorbed by the New England Steel Corp. The management and operation of the plant will not be changed. The Metal Ball Co. has been operating full time during the past month. The plant was overhauled completely and new machinery installed during the summer. The New England Steel Corp. was incorporated some time ago with $50,000 capital stock by Walter A. Reynold, J. Moss Ives, and Powel Chandler. It is now reported that these original incorporators merely represented the owner, which is said to be the Roland Steel Co., New York.

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SALE of $75,000 worth of stock has made the merger of the Dennison Foundry Co. and the Resistant Alloy Casting Co., New Cumberland, W. Va., assured, according to officials of the Dennison company. The money realized from the stock sale is to be used for remodeling the Dennison plant which will be converted into a plant for the manufacture of steel rolls for rolling mills. It is reported that new machinery will be installed and two new furnaces constructed.

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THE Phoenix Utility Co., 65 Broadway, New York, has placed a large order with the Chapman Valve Co., Indian Orchard, Mass., for high pressure steel gate valves, motor operated, for the Market street steam electric station, New Orleans. The Phoenix company also awarded contracts for 300 tons of malleable iron shoes to Positive Rail Anchor Co., Marion, Ind., and 4500 tons of steel bands to the Bethlehem Steel Corp., for a wood stay pipe line in connection with the water development project at Kemles, Pa.

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PEOPLES ELECTROBUS CORP., New York, recently was organized to establish, maintain and operate stage and omnibus routes in New York, and to further the manufacture and sale of the type of carrier used. George Loft, 400 Broome street, New York, president of Loft's, Inc., is president of the new company. John Larkin, 44 Wall street, attorney in Larkin, Andrews & Hull, is vice president, Harold P. Childs, 11 Broadway, engineer and eastern manager of the Heine Boiler Co., treasurer and William B. Randall, 66 Broadway, president of the Security Register & Transfer Co., is secretary. The directors include the officers and Charles Berg, engineer and formerly vice president and general manager of the Commercial Truck Co., Philadelphia.

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ETNA MACHINE CO., Toledo, O., manufacturer of machinery and gray iron castings, plans construction in the near future of a foundry of the latest type. It will be located on the site of the old plant. The company at present is engaged in the construction of a charging floor only, expansion being delayed so as to allow production to continue unhampered. The new building includes a locker and wash room, machinery room and charging floor. The company is installing cupolas and blowers, elevators, air compressor, etc. As soon as this unit is complete and ready to run, the company will consider the construction of the remainder of the building. Action on the next unit is not expected until early spring. E. F. Abbey is president and manager and L. P. Byers is secretary and treasurer.

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ORGANIZATION of W. Horace Williams Co., Inc., 80 Howard avenue, New Orleans, to do an engineering and general contracting business, has been announced. The company will specialize in the construction of docks, wharves, piers, breakwaters, dams, jetties, bridges, railways, highways, industrial plants, etc. W. Horace Williams, president of the new company, is a member of the American Society of Civil Engineers and of the Louisiana Engineering Society. J. L. V. Grenier is vice president. C. G. Cappel, vice president, is a member of the Louisiana Engineering Society and associate member of the American Society of Civil Engineers. R. E. Gosa, is vice president, A. T. Gomila, treasurer, and Roland A. Thomas, secretary. Mr. Williams also is president of Doullut & Williams Co., Inc., that corporation being in process of dissolution and liquidation.

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CONTINUING its policy of expansion, the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., now has two new buildings and one addition under construction at the main works of the company there. The three buildings will be of modern type and it is expected they will be completed and ready for occupancy by the first of the year. The process building, which is fairly well along toward completion, is being erected in the north yard of main works. It will be a 1-story building of saw tooth construction and of brick, steel frame and metal sash. The total cost is estimated at $120,000. The circuit-breaker test building is being erected in the south yard of the main works. The building will be of brick, steel skeleton and metal sash construction and will contain one 5-ton crane. The new addition will be a 2-story structure.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

W. C. STEVENSON, who has been resident manager of the Cincinnati office of Hickman, Williams & Co. for the past five years, has been transferred to their Pittsburgh office to become assistant to the president. Mr. Stevenson has been connected with this company since his youth. John H. Tressler who has been associated with the company for about five years will succeed to the duties of Mr. Stevenson at Cincinnati.

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F. L. Atwood has severed his connection with the Mid-West Pump Works, Anderson, Ind.

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W. W. Lukens, vice president of the Alan Wood Iron & Steel Co., has left for a European trip.

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W. A. Gowing has been appointed representative for the state of Michigan and Toledo, O., for the Cyclops Steel Co., Titusville, Pa.

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N. D. Farmer, recently made treasurer of the Austin Machinery Corp., Muskegon, Mich., formerly was comptroller of the Carborundum Co.

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Charles R. Smith, formerly of the field force of the American Appraisal Co., Milwaukee, has been advanced to superintendent of that company.

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Frank W. Small recently has been made general manager of the Steel Tank & Pipe Co. of Oregon, with headquarters in Portland, Oreg.

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A. T. Davis, formerly with the Detroit Stove Works and the Ferro Enamel Supply Co., Cleveland, now is with the Cincinnati Enameling Co., Cincinnati.

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Charles Anderson, secretary and treasurer as well as general manger of the Belle City Malleable Iron Co., Racine, Wis., has been elected president of the Racine association of commerce.

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Alonzo B. Sherow has resigned as export manager of J. K. Larkin & Co., 253 Broadway, New York. No announcement has yet been made as to his successor.

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Frederick E. Bausch, 1105 Chemical building, St. Louis, has been appointed as district representative in Missouri by the Conveyors Corp. of America, Chicago, manufacturer of coal and ash handling equipment.

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Paul G. Leoni, managing director of the Iron & Ore Corp. of America, 11 Broadway, New York, will sail

W. C. STEVENSON

Dec. 6 on the LEVIATHAN on a business trip to Europe, to return in the latter part of January.

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Malcolm Fleming, who has represented Galey & Lord, Inc., in the Chicago district, will assume active management of the Cincinnati office of Hickman, Williams & Co., Dec. 15. He succeeds E. P. Hettiger, who has resigned to devote his time to special interests.

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Stoddard B. Martin, for 10 years with the Windsor Machine Co., and its successor, the National Acme Co., now is representing the Cone Automatic Machine Co., Windsor, Vt. He will make his headquarters at 1899 East Eighty-second street, Cleveland.

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William H. Pouch, president of the Concrete Steel Co., 42 Broadway, New York, in presiding at the thirtieth annual dinner of the New York Credit Men's association, of which he is president, predicted an era of prosperity in this country during the next two years.

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Neil C. Lamont, formerly connected with the Worthington Pump & Machinery Corp., New York, at its Power & Mining Machinery Works, Cudahy, Wis., now is at the New York office as assistant to the vice president.

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C. A. Walker, has become associated with Carbaugh & Lewis, as office manager and supervising senior accountant. He has been connected with the National Screw & Mfg. Co., Cleveland. He is a member of the Cleveland Engineering Society.

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A. L. Abrahams recently added to the organization of Kny-Scheerer Corp. of America, New York, manufacturer of surgical instruments, scientific apparatus, etc., as general plant manager, formerly had been connected with the Hale & Kilburn Corp., Philadelphia, and also with the automotive industry.

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Hans Renold of Manchester, England, who has been visiting machine tool manufacturers inspecting equipment, was a visitor in Boston recently calling at the plant of Boston Gears, Inc., Norfolk Downs, Mass., American agents for Renold's silent chain.

* * *

Arthur F. McCarty, associated for several years with Steward & Stevens Iron Works and Montgomery Iron & Steel Co., Philadelphia, announces his withdrawal from the service of the latter company, effective, Nov. 1, and his association, in capacity of manager of sales with the Darby Iron Works, Darby, Pa.

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Linwood D. Latta has been appointed secretary and treasurer of the Wayne Agricultural Works, Inc., Goldsboro, N. C., founder and manufacturer of plows and plow castings, grate bars, etc. Mr. Latta formerly was secretary of the N. Jacobi Hardware Co., Wilmington, N. C. D. W. Davis is president of the Wayne works.

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L. R. Putnam has resigned as general manager and treasurer of the Ashland Steel Co., Ashland, Ky., his resignation being effective as of Nov. 1.

Mr. Putnam has left the industrial field to take over the general agency for eastern Kentucky of the Standard Accident Insurance Co., Detroit. He had been connected with the Ashland company 34 years, starting as a bookkeeper. In 1892 he was made treasurer and in 1911 was appointed general manager.

* * *

Walter N. Crafts, who recently became associated with the American Chain Co. as works manager of the Reading Steel Casting Co., Reading, Pa., previously had been with the Canadian Electric Steel Co., Ltd., Montreal, for the past five years being general manager of the latter company. During the war Mr. Crafts was general superintendent of the Toronto plant of British Forgings, Ltd., the largest producer of electric furnace steel for shells at that time. Mr. Crafts some years ago developed a special type of electric furnace for steel making purposes.

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C. W. Titgemeyer, for 18 years connected with the Osborn Mfg. Co., Cleveland, has been appointed general sales manager of the brush division.

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F. B. Keith, recently appointed district sales agent for the Seneca Iron & Steel Co., Buffalo, N. Y., with offices in the Woolworth building, New York, formerly was connected with the Youngstown Sheet & Tube Co.

W. F. Stahl, formerly in charge of the New York office returns to the main office in Buffalo as assistant general manager of sales.

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J. R. Lawrence, for seven years connected with the Motch & Merryweather Machinery Co., Cleveland, now is in the sales department of the Marshall & Huschart Machinery Co., Chicago. Mr. Lawrence left the Motch & Merryweather company about seven months ago to recuperate in Canada from a nervous breakdown. He returned to the Cleveland company around the first of November but left shortly afterward to join the Marshall organization.

* * *

C. S. Garland, manager of the coke department of Hickman, Williams & Co., Inc., Pittsburgh, has been removed to the New York office to take charge of that entire office, serving in the capacity of district manager in New York. D. H. Goodrich will succeed Mr. Garland at Pittsburgh.

S. Davidson Herron, formerly of Pittsburgh but recently affiliated with the A. M. Byers Co. at Chicago, has been appointed district manager at Philadelphia for Hickman, Williams & Co., taking charge of that office and district.

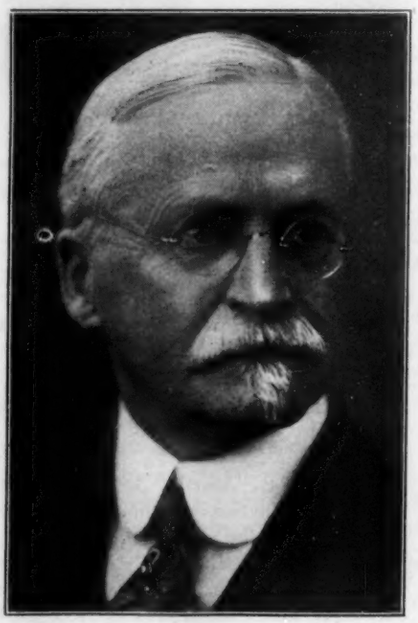
Completes Eminent Industrial Career

GEORGE E. EMMONS, who has requested to be relieved of his responsibilities as vice president in charge of manufacturing of the General Electric Co., Schenectady, N. Y., as announced in the Nov. 20 issue of IRON TRADE REVIEW, has been connected with that company for approximately 40 years. The board of directors of the General Electric Co. has acceded to the wishes of Mr. Emmons and granted his request. After the meeting of the board of directors, Gerard Swope, president, issued the following statement:

"G. E. Emmons, vice president in charge of manufacturing, has asked to be relieved of the responsibilities of his position, which he has carried so ably and so long. Mr. Emmons has served the company loyally, wholeheartedly, and indefatigably for almost 40 years. In this time the manufacturing operations of the company have grown from small beginnings to their present magnitude in volume of business, in number of plants and in number of employees. He has met his arduous responsibilities not only with outstanding ability, but in a manner which has won and held the respect and affections of workers in all grades of service throughout the organization.

"The board of directors, in passing upon Mr. Emmons' request for retirement, has acceded to his wishes, with regret but with full recognition of the justice of the request. It has spread upon the minutes of the board of directors of the company a resolution expressing its appreciation of his long and loyal service, its admiration of the manner in which his work has been performed and the affection with which the directors, in common with his 70,000 co-workers of the General Electric family, regard him.

"It is the hope of the board of directors, officers, and all Mr. Emmons' associates that in his California home, surrounded by those dearest to him, he will enjoy many years of life of health and happiness. He will carry with him the most valuable tribute that any man can have, the enduring affection that he has won in the hearts of his associates."



GEORGE E. EMMONS

Mr. Emmons will make his home in Pasadena, Cal., where his family has lived for several years. In his 40 years connected with the Thomson-Houston Co. and the General Electric Co., Mr. Emmons has seen the electrical industry develop from a few small workshops to its present status as one of the basic industries of the country. With Prof. Elihu Thomson and E. W. Rice, Jr., honorary chairman of the board, he worked in the little plant of the American Electric Co., New Britain, Conn. Mr. Emmons started there as a bookkeeper, having had no technical training. He was born in Westchester, Conn., Sept. 9, 1857. After a common school education he worked in a country store until 1880, leaving to join the American Electric Co. The American company merged with the Edison General Electric Co. in 1892 to form the General Electric Co., but Mr. Emmons left the American company in 1881 to enter the saddlery hardware business. He returned to the electrical industry in joining Thomson-Houston Electric Co., Lynn, Mass., in 1886, and since has been continuously in the service of that and the General Electric companies. In 1893 he was appointed works manager at Lynn, by the General Electric Co., and in 1894 came to Schenectady as assistant manager of that works. For 25 years since 1895 he has been works manager. In 1913 he was appointed chairman of the manufacturing committee and in 1916 became a vice president in charge of manufacturing.

Machinery Market Still Dull

No Reaction Expected To Increase Interest Until After the Holidays—Spirit Better in Some Sections Indicating Heavier Buying After Jan. 1—Used Tool Inquiry and Sales Active but Spotty—Crane Orders Coming More Slowly

NO IMPROVEMENT is expected in the machine tool market until after the usual holiday dullness. Market spirit and sentiment is decidedly better in some sections but the most optimistic look for little increase in buying until after Jan. 1. If half of the actively pending business could be closed in 1924, December would be one of the most productive months of this year. Hesitancy still rules and much figuring and refiguring characterizes most of the current transactions. Gradually improving conditions in iron and steel and metalworking industries are expected to be reflected within a month or two in more interest in machine tools. Plant expansion also is more common and several national manufacturers are establishing new plants.

School board purchases for vocational training purposes involve the only large lists now active. Between 35 and 40 tools are expected to be placed within the week for the Essex county vocational school, Irvington, N. J. Bids have been requested on 24 lathes for the Chicago board of education. Awards have been made but contracts not received on 60 odd tools from the Cleveland board.

Railroad purchases during the past week were scattered and confined largely to single items. The Pennsylvania has added a number of tools to its current inquiry. Central Vermont and Maine Central railroads have lists out. Most railroad inquiries now current are estimate seekers for budgeting purposes. Industrial buying is small and except for purchases by such companies as Westinghouse Airbrake Co. and Westinghouse Electric & Mfg. Co., is confined to single tools. Nash Motors Co. has placed multiple spindle drills and centerless grinders.

Used tool inquiry continues active and plentiful, but sales are scattered and small. Small tools are in greatest demand.

Several good crane sales were made in the past week, Allegheny Steel Co., Youngstown Sheet & Tube Co. and others being listed among the buyers. The largest active inquiry is that for 47 or 48 cranes for the plants of Carnegie Steel Co.

School Board Inquiries Only Large Lists

NEW YORK, Dec. 9.—Featuring an otherwise dull machine tool market is a list for the Essex County Vocational school, Irvington, N. J., issued through headquarters at Newark. Fully 35 or 40 metalworking machines are involved as well as a number of woodworking tools and small hand tools, etc. Quick action is demanded, as virtually only a week will have elapsed from the time the list was issued until it is closed tomorrow.

Among scattered orders are a 90-inch journal turning lathe, an 84-inch boring and turning mill, a 36-inch x 16-foot lathe, and a heavy duty planer, 36 inches x 10 feet, for the Southern railway. A 6-foot radial drill has been purchased by the Wabash railroad and a car box boring machine by Ford & Kimbell. An interesting order is that of the American Hard Rubber Co., New York, involving 16 large gear reduction units.

Included in the Essex vocational school list are two surface grinders, two sensitive drill presses, two drill presses and four 16-inch shapers, all of different companies. Also included are milling machines, two universals and others, one universal grinder, two bench lathes, three 14-inch x 6 foot lathes, two 14-inch x 4-inch Hendey lathes, two 14 x 6, one 14 x 6 Hendey lathe, one 14-inch x 4-foot lathe and one 14-inch x 8-foot lathe. Other items involve two 14-inch x 6-foot lathes, two 14-inch x 6-foot lathes of another make, one 12 x 5 lathe, two grinders, one arbor press, one power hacksaw, and one Dumbre centre grinder. A Stewart triple purpose furnace is also involved. A prospective buyer is the Norfolk & Western, Roanoke, Va., which recently closed on 500 tons of structural steel for a machine shop addition.

Crane orders continue to come through slowly. Some sellers look for a substantial gain after the first of the year, but if the present volume of new inquiries may be taken as an indication, it will not come anytime soon.

Better Activity at Cleveland

CLEVELAND, Dec. 9.—Slightly better activity was noted in the local machine tool market last week, despite reports by some interests that the dullness of the last few weeks continues unaltered. Awards have been made on 60 or more tools by the Cleveland board of education, although formal contracts have not been placed. Strong, Carlisle & Hammond Co. was awarded the 11-inch lathes.

Several added inquiries for railroad tools came into this territory but no sales were made of large machines. Industrial demand in a few cases is better, but the general hesitancy prevailing in previous months still exists.

Used tool buying is lagging and inquiry also is lighter. One dealer reports a heavier business last week than in any week of November, but this is not general although helping to bring up the volume of sales being transacted.

Crane builders are booking less business in this territory, but sufficient work still is on contract to maintain operations well into 1925.

The Royal Brass Mfg. Co., Cleveland, C. W. Brennan, general manager, is in the market for a core oven, a medium size sprue cutter and pit melting furnaces, preferably used equipment.

Holidays Loom as Dull Period

PITTSBURGH, Dec. 9.—While the majority of machine tool users now in the market for groups of tools will probably postpone action until early next year, one or two such as Carnegie Steel Co. for its Edgar Thomson plant, are talking about ordering before the holidays. This interest defers action on its other lists that are pending. The Westinghouse Airbrake Co., Wilmerding, Pa., has ordered three machines this past week and may buy more. The Westinghouse Electric & Mfg. Co.'s list for first quarter is expected to come out soon. The desire appears to avoid showing a large

invested capital in the inventories to be taken the latter part of this month and to have larger bank balances, hence no real purchases are expected to develop between now and the end of the year. The Pennsylvania railroad has added to the number of tools it has under inquiry.

The volume of used machinery inquiries still holds up well although orders are spasmodic. One interest has issued inquiries for four separate items. A seller of this type of equipment here disposed of a large testing machine to an Ohio steel interest. An out-of-town user has purchased 18 small presses from a new machinery seller here this past week, which also disposed of a 20-ton press to a nearby manufacturer.

Several additional crane sales are noted for the Allegheny Steel Co., Youngstown Sheet & Tube Co., Superior Steel Corp., and others. Inquiries for cranes, hoists, etc., are heavy, mainly from United States Steel Corp. units.

In connection with foundry equipment, the sale of molding machines since the election has been particularly good, as reported by the Herman Pneumatic Machine Co. One order from the Sterling Steel Foundry Co., Braddock, Pa., calls for nine machines. The American Laundry Machinery Co., Rochester, N. Y., purchased six and the Mt. Vernon Car & Mfg. Co. bought six car wheel machines for its new foundry, and additional orders are to follow. The Mutual Foundry Co., Franklin, Pa., bought a large quantity of foundry equipment, including core ovens, tumbling barrels, grinding machines, and miscellaneous equipment and supplies. The Miles Plastic Bronze Co., Pittsburgh, bought a 42-inch electric furnace and the Pittsburgh Meter Co. purchased one from the Detroit Electric Furnace Co. The Mesta Machine Co. bought a 14-cubic foot sand mixer and the Pennsylvania railroad, Altoona, Pa., closed on two worm-geared crane ladles.

Inquiry for January Heavy

BOSTON, Dec. 9.—Further interest in January machine tool buying is expressed in the inquiry which has developed during the week. This is the inventory period with many manufacturers so that some of the lists which have appeared before the trade possibly are for inventory purposes. The Maine Central and Central Vermont railroads each has a list out for preliminary figures. Actual sales closed in Boston during the week have been few although slightly ahead of the small total of a week ago. A textile machinery manufacturer bought several tools. A printing press manufacturer purchased two lathes and a shaper. Other manufacturers scattered throughout the district placed individual tool orders totaling nearly a dozen.

Used tool sales also have been few. New England machine tool manufacturers, report a better national demand.

Market Spirit Turns Upward

CINCINNATI, Dec. 9.—Conditions turned for the better in the machine tool market in this section last week and manufacturers as well as dealers express greater hopefulness over the future. The feature of the week was the large volume of single tool sales, involving planers, boring mills, grinders, lathes and drill presses. The G. A. Gray Co. received an order for a 24-inch planer from the American Steel & Wire Co., Trenton, N. J., and another from a company in London, Eng., for a similar size machine. The Cincinnati Planer Co. and other Cincinnati machine tool builders report a larger number of inquiries for single units from Japan, Mexico, Australia and South American countries. The trade is of the opinion that the first half of 1925 will witness an unprecedented boom in the demand for machine tools, as most of the users are planning considerable expansion. Railroad inquiry is on the upturn and while recent sales have involved one or two machines for the most part, inquiries involving fair sized lists are making their appearance in the market.

During the past week improvement has also been noted in the used machinery market. Several sales of equipment, consisting chiefly of small tools are reported and inquiries have increased.

School Work Bidders Fewer

CHICAGO, Dec. 9.—Only seven bids were received last Tuesday by the Chicago board of education for providing 24 lathes for the Tilden technical high school, compared with 22 bids received two months ago on similar business. A week or 10 days probably will elapse before this business is placed. The Nash Motors Co. has placed some multiple spindle drills and some centerless grinders. Several large orders for production machinery are expected to develop within the next few days from Chicago district manufacturers.

Business in the machinery market in this district is rather spotty. Some sellers have experienced a good run of inquiry while others have done little more than dispose of single tools. Several houses report the best inquiry since 1920. The railroads continue to seek prices for budget-making purposes, but buying is some distance off.

Crane Awards and Inquiries of the Week

Orders Placed

Three electric cranes for the Knoxville, Tenn., shops of the Southern railway, to the Whiting Corp.; one is a grab bucket crane for cinder pit use; another is for a power plant, while the third is of a special type for a round house.

Two 15-ton, 20-foot span cranes for the Youngstown Sheet & Tube Co., to the Morgan Engineering Co.

Single Installations

50-ton locomotive crane for William Ballard, Syracuse, N. Y., general contractor, to Industrial Works, through Ridenour, Seaver & Kendig, Cleveland, Buffalo and Pittsburgh.

25-ton locomotive crane for the Cullen Fuel Co., Thirtieth street and East river, New York, to the McMyler-Interstate Co.

25-ton locomotive crane for the Elgin, Joliet & Eastern railroad, to Industrial Works.

15-ton crane with 75-foot span for the Allegheny Steel Co., Brackenridge, Pa., to the Shaw Electric Crane Works.

15-ton gasoline crawler crane for the Public Service Corp., Newark, N. J., to the Link-Belt Co.

12-ton locomotive crane, 32½-foot boom, for the Lynn Gas & Electric Co., Lynn, Mass., to the McMyler-Interstate Co.

10-ton handpower crane, for the Public Service Corp. of New Jersey, Newark, N. J., to an unnamed builder.

10-ton electric crane, 45-foot span, for the Lucas Machine Co., Cleveland, to an eastern builder.

10-ton electric crane, 35-foot span, for the American Car & Foundry Co. plant, Berwick, Pa., placed, the order reported going to the Harnischfeger Corp.

10-ton magnet crane with 77-foot span for the Superior Steel Corp., Carnegie, Pa., to the Harnischfeger Corp.

5-ton double I-beam crane, 25-foot span, for a stoneyard in Brooklyn, N. Y., to the New Jersey Foundry & Machine Co.

Locomotive crane for the American Sheet & Tin Plate Co., understood to have been awarded the Ohio Locomotive Crane Co.

Orders Pending

47 or 48 cranes, Homestead, Pa. and other plants of Carnegie Steel Co. in Pittsburgh district, the remaining portion of that interest's improvement program calling for complete installation of 57 cranes; two or three additional orders to be placed this week.

Four cranes for the McDonald works, Carnegie Steel Co., Youngstown; appropriation not arranged.

Two special locomotive cranes for the Pennsylvania railroad; tentative inquiry out pending appropriation of funds for their purchase.

Several cranes for National Tube Co., Gary, Ind., including 25-ton, 10-ton and several smaller 3-ton and 5-ton cranes; orders to be placed shortly.

One or two cranes for Jones & Laughlin Steel Corp., Pittsburgh, for its Memphis terminal; matter still in abeyance.

5 to 7½-ton used electric crane, 60-foot span, for F. Howard Mason, 15 Park Row, New York; bids asked.

Recent Industrial Business Changes

THE United States Metallic Packing Co., Philadelphia, has taken over the entire business of the Locomotive Lubricator Co., Chicago, manufacturer of force feed lubrication systems. W. J. Schlacks, C. W. Rudolph and O. H. Neal, formerly of the Locomotive company, have become affiliated with the Metallic company.

* * *

M. V. All Weather Train Controller Co., New York, has changed its name to the Burrows Train Control Co.

* * *

Miller Carson & Co., Pennsylvania building, Philadelphia, have been appointed sales agents for the pig iron produced by the Emporium Iron Co.

* * *

Most of the outstanding mortgage bonds of the Superior Coal & Dock Co.'s property on the bay front of Duluth, Minn., have been purchased by Henry Ford.

* * *

Thomas Screen Ventilator Co., manufacturer of an all metal ventilator, has selected Wilkes-Barre, Pa., as the site for its manufacturing activities.

* * *

Gonzales Electric Light Co. and the Gonzales Water Power Co. have been purchased by the Central Power & Light Co., San Antonio, Tex.

* * *

Lazar Mfg. Co., St. Louis, manufacturer of ornamental bronze and iron since 1884, has appointed the Nachary Building Supply Co., New Orleans, as its sales representative in the state of Louisiana.

* * *

General Elevator Co., Baltimore, manufacturer of passenger and freight elevators, has moved its headquarters from 400 South Charles street to a new location at Bush and Ridgeley streets.

* * *

Southwark Foundry & Machine Co., Philadelphia, designer and builder of hydraulic equipment, power tools and special machines, has discontinued its office in Cleveland and the transactions in that district will be handled from its office at 100 East South street, Akron, O. F. H. Smith will be in charge of the Akron office.

* * *

The Austin Machinery Corp., 3500 Dorr street, Toledo, O., has removed its offices to 1075 Lake Shore Drive, Muskegon, Mich. O. D. Seyferth is vice president and general manager.

* * *

Bessler Movable Stairway Co., Akron, O., manufacturer of an all steel movable stairway for fireproof construction, has opened a direct plant branch in the Builder's Exchange, Rose building, Cleveland, in charge of E. B. Horn.

* * *

Philip Carey Mfg. Co., Lockland, O., manufacturer of roofing, has established a branch office and warehouse at Atlanta, Ga. E. O. Perry, formerly district representative of the company, has been appointed manager of the new branch.

* * *

The Debevoise-Anderson Co. has been appointed exclusive sales agent of the pig iron produced by the Thomas Iron Co., effective Jan. 1. The company will market the iron through its offices in New York, Philadelphia and Boston.

* * *

C. J. Franklin, representative for the Moltrup Steel Products Co., Tippett & Wood, Judson Mfg. Co., Utah Steel Co., and other steel companies, has moved his offices from 421 Stark street to 1027 Sandy boulevard, Portland, Oreg.

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Standard Gauge Steel Co., Beaver, Falls, Pa., manufacturer of finished steel specialties, announces the removal of its Chicago office to 547 Webster building, 327 South LaSalle street, in charge of S. A. Dinsmore, district sales manager.

* * *

The capital stock of the International Marine Welding Co. of New York, 30 Church street, New York, was owned by the Hudson Shipbuilding & Repair Co., Newburgh, N. Y. Upon dissolution of the International company, the assets were turned over to the parent company which will continue the welding operation. W. W. Gerrhart was president of the International company.

* * *

The Jervis Foundry & Machine Co., Albany, Ala., has been taken over by A. B. Dodd who will operate the business under the name of the Jervis Machine Co. Mr. Dodd had been with A. D. Jervis, previous owner, for about 12 years as foreman.

* * *

The Great Lakes Distributing Co., Detroit, miner and shipper of core and blast sands has changed its name to the Great Lakes Foundry Sand Co. No change in ownership, management or policies has been effected. Offices of the company are in the Penobscot building at Detroit.

* * *

Foote Bros. Gear & Machine Co., 215 North Curtis street, Chicago, manufacturer of gears, has appointed Chas. Bond & Co., Philadelphia, for the distribution of the Foote gears and products in eastern Pennsylvania and Maryland, Delaware and all of New Jersey south of Mercer county.

* * *

Articles have been filed by the Boehck-Lowe Machinery Co., Milwaukee to change the name to Boehck Machinery Co., Richard E. Boehck now being the principal owner. The company is about to leave its old quarters at 71 West Water street for its own building now being finished at Twenty-fourth and Clybourn streets.

* * *

The Hyman-Michaels Co., Chicago, due to its expansion in the railroad equipment field, has engaged the services of F. W. Glauser, formerly associated with the Mid-Continent Equipment & Machinery Co., St. Louis. Mr. Glauser will be located in St. Louis where he will assume the management of the equipment department for the southern territory.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

GADSDEN, ALA.—Eureka Foundry Co., will construct a foundry and machine shop on Ewin avenue, near Coosa street. Evan Owen is manager of the company which makes gray iron, brass and aluminum castings.

EMERYVILLE, CAL.—Stewart Mfg. Co., 4071 Hollis street, has retained Miller Warnecke, 1404 Hollis street, as architects for plant for manufacture of hardware and accessories.

LOS ANGELES—Western Machinery Co., 900 North Main street, manufacturer of engines, plans constructing plant to cost about $250,000.

LOS ANGELES—Master Service Co., 1510 West Eighth street, has awarded contracts for constructing 1-story, 75x276-foot plant for automobile repairing on Whittier street.

LOS ANGELES—Monarch Screen & Mfg. Co. has awarded contracts to Hamm & Grant, Inc., 607 Ferguson building, engineers, for 1-story, 75x123-foot garage.

LOS ANGELES—Auto Sheet Metal Works, 2003 South Main street, has awarded contracts for constructing 1-story, 100x100-foot plant on South Park street.

OAKLAND, CAL.—National Electric Sign Co., 510 Eighteenth street, plans constructing 1-story, 100x100-foot plant at Thirtieth and Myrtle streets. Austin Co., Santa Fe building, San Francisco, is engineer.

SAN DIEGO, CAL.—A. W. Mitchell plans 2-story, 100x200-foot garage. J. & D. Parkinson, Title Insurance building, Los Angeles, are architects.

SAN FRANCISCO—Gay Engineering Co., 311 California street, manufacturer of refrigerating machinery, plans constructing 1-story plant on Fourth street.

SAN FRANCISCO—Folsom Street Iron Works, Folsom and Seventeenth street, has awarded contracts for constructing 1-story foundry.

SAN FRANCISCO—G. A. Clough, Monotype Co., 560 Mission street, has awarded contracts for constructing 2-story plant at Hawthorne and Folsom streets.

NEW HAVEN, CONN.—The United Iron & Metal Co. has been incorporated for $25,000 by William Alderman and others.

ATLANTA, GA.—Lockwood, Greene & Co., Boston, engineers and builders, have been retained by the Atlanta Ice & Bottling Co. to supervise improvements to its boiler house which will include installation of three new boilers.

BELLEVILLE, ILL.—Midwest Stove & Range Co., 2628 West Main street, has been incorporated for $35,000 to manufacture and deal in stoves, ranges, furnaces, and household appliances, by Theodore A. Stoelzle, Frank F. Stoelzle and Elmer E. Frees.

BLOOMINGTON, ILL.—Oil-O-Matic Heating Co. contemplates constructing 1-story, 80x300-foot cut stone manufacturing plant. C. W. Williams, 207 West Washington street, is manager. A. T. Simmons is architect.

CHICAGO—The G. & W. Electric Supply Co., 7440 South Chicago avenue, has awarded contracts to the Austin Co., 160 North La Salle street, for 1 or 2-story brick plant.

CHICAGO—Sol Ellis & Sons, Inc., 2118 South State street, has been incorporated for $50,000 to manufacture and deal in plumbing, heating, electrical supplies, etc., by Sol Ellis, Ben Ellis and Alfred Ellis.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

CHICAGO—Paul Palmer Co., 549 Fulton street, has been incorporated with 20 shares no par value stock, to manufacture and deal in machinery and tools, by Paul E. Palmer, Frederick C. Jewell and Henry S. Jewell.

CHICAGO—Road Leader Mfg. Co., Inc., 117 North Dearborn street, has been incorporated for $10,000 to manufacture and deal in automobile accessories, by Joseph H. Sherman, C. Sherman and Philip Sherman.

CHICAGO—Charles Joyce, 5211 South Halsted street, has taken bids on constructing 1-story, 48x122-foot brick and mill cut stone garage at 4717 Halsted street. A. G. Lund, 453 West Sixty-third street, is architect.

CHICAGO—Universal Line Lock Co., 1138 North Lockwood avenue, has been incorporated for $100,000 to manufacture and deal in hardware specialties, etc., by Frederick W., Minnie H., and Carlyle H. Meyers.

CHICAGO—Geo. J. Halligan Co., 4628 West Roosevelt road, has been incorporated for $25,000 to manufacture and deal in valves, fittings, pipe, metals, metal goods, etc., by George J. Halligan, A. M. Halligan and George W. Dammann.

CHICAGO—Buckwalter Radio Corp., 2632 Prairie avenue, has been formed with $31,000 capital, to manufacture and deal in radio machines, supplies, parts, etc., by C. J. Buckwalter, W. L. Bourland and Paul Hassell.

CHICAGO—Pitter Ventilating Fan Co., 7[illegible] West Washington street, has been incorporated for $60,000 to manufacture and deal in machinery and fans, by James P. Buckley, Campbell Marvin and A. Bezemensky.

CHICAGO—American Ore Reclamation Co. is clearing site for constructing a sintering plant at 108th street and Calumet river. By-Products Coke Corp. is owner. C. D. Caldwell, 322 South Michigan avenue is president. The American Ore company is contractor.

CHICAGO—Frank J. Feeney, Inc., 7346 Stony Island avenue, has been incorporated for $50,000 to manufacture and deal in automobiles and automotive products, parts and accessories, by J. Kelly and Joseph D. Daly and James D. Murphy.

CHICAGO—Arroat Electric Co., 1622 West Sixty-third street, has been incorporated for $20,000 to do general and electrical contracting, manufacturing and selling electrical equipment and appliances, by Thomas Giffney, Anton Abramio and Albert L. Rietz.

CHICAGO—McGarry Body Co., 1440 69 West Washington street, has been incorporated for $10,000 to manufacture and deal in body lifting or dumping appliances, machinery, etc., by L. E. Komorous, E. J. Langhamer and L. J. Cochran.

PEORIA, ILL.—Cold-I-Auto-Starter Co., 906 Lehmann building, has been incorporated with $1000 capital, to manufacture and deal in automobile attachments, accessories and equipment, by J. T. Hunter, Sarah E. Sloan and John F. Sloan.

RIVER FOREST, ILL.—Charles Marott, has retained Wolf, Sexton, Harper & Truax, 7 West Madison street, Chicago, as architects for 2-story auto sales and repair shop.

ANDERSON, IND.—National Engineering & Equipment Co. has been incorporated by William N. Durbin, R. I. Van Winkle, Joseph E. Hennings, Linfield Myers and Allan Etchison. Mr. Durbin, head of the new company, had been with the Anderson Foundry & Machine Works for 35 years. The new company will manufacture and deal in power equipment and other machinery.

EAST BLOOMINGTON, IND.—Showers Bros. Co. has awarded H. K. Ferguson Co., Cleveland, engineer and builder, contract for a plant to provide 50,000 square feet of floor space. The Showers company manufactures kitchen cabinets and other household accessories.

EVANSVILLE, IND.—The Berryhill Malleable Iron Co. has been incorporated with $150,000 capital stock and 7500 shares of no par value common stock. The incorporators are Daniel Wertz, Edward Kiechle and John H. Berryhill.

HAMMOND, IND.—Calumet Sheet Metal Works, Inc., has been incorporated with $25,000 capital, by Englehardt Ulrich, Alva Wertzberger and Clinton Costello.

OAKLAND, ME.—Emerson & Stevens Co. is building a new shop to replace that formerly damaged by fire, to manufacture scythes and axes.

SPENCER, MASS.—Wickwire-Spencer Steel Corp. has awarded contracts for a 1-story, 54 x 112-foot annealing building at the Wire Village plant of the Spencer works.

WORCESTER, MASS.—Worcester Stamped Metal Co. has broken ground on a 2-story, 35x105-foot plant of brick which is to be constructed.

UNIVERSITY CITY, MO.—Rotary Oil Burner Co. of Missouri, 6362 Delmar boulevard, has been incorporated for $10,000 to manufacture and deal in heating devices and appliances, by P. J. Dahl, J. R. Van Dyke, W. R. Wild, C. D. Smuley, Jr., and Spencer M. Thomas.

NEWARK, N. J.—Plans are being prepared by the Artistic Metal Products Corp., for the rebuilding of its plant recently damaged by fire. The loss is estimated at $25,000.

BROOKLYN, N. Y.—Mark Iron Works has been incorporated for $50,000 to manufacture steel products, by S. Null, G. Kaplan and S. M. Stein, with Kopp, Markenich & Perlman, 51 Chambers street, as attorney.

BUFFALO, N. Y.—Essex Iron & Steel Co. has been incorporated for $25,000 to manufacture and deal in iron and steel products, by H. F. Dolan, C. F. McMahon and G. Benjamin, with S. J. Hollender as attorney.

CORNING, N. Y.—La-Don Co. has been incoroprated with 500 shares no par value stock to manufacture and deal in metal products and sheet metal, by I. Allison, S. Roe and M. Foy, with Baldwin & Allison, Elmira, N. Y., as attorney.

NEW YORK—Bragg-Kliesrath Corp. has

been incorporated with 2000 shares no par value stock to manufacture and deal in machinery, by C. S. Bragg, V. W. Kliesrath and R. F. Hoyt, and F. J. Knorr, Albany, N. Y., attorney.

NEW YORK—International Hydro-Carbon Co., has been incorporated for 1000 shares no par value stock to manufacture gases for welding and other commercial purposes, by W. N. Trace, F. Druss and E. Goodman, with W. W. Lesselbaum, 42 Broadway, as attorney.

NEW YORK—Bond Electric Mfg. Co. has been incorporated for $10,000 to manufacture and deal in radio accessories and electrical equipment, by A. A. Badian, H. Reifel and B. Miller, with K. M. Marcus, 144 Rivington street, as attorney.

CINCINNATI—Chipman Plating & Foundry Co. was damaged by fire Dec. 4, with heavy loss to machinery and finished products and accessories. Horace A. Chipman and Horace C. Chipman conduct the business.

CLEVELAND—Central Brass Co. is in the market for 65 tons of concrete reinforcing bars for the construction of a new plant here.

CLEVELAND—The Royal Brass Mfg. Co. is in the market for a core oven, a medium size sprue cutter and pit melting furnaces, preferably used equipment. C. W. Brennan, is general manager.

CLEVELAND—Ajax Mfg. Co., 3830 Lakeside avenue, has retained Withington, Roberts, Wright Co., 622 Swetland building, for 128x364-foot main building, 60x200-foot pattern storage building; 60x60-foot pattern shop; 72x140-foot forge shop and boiler house, and a 25x100-foot, 2-story, office.

CLEVELAND.—The McIntosh Engine Co., 822 Leader building, has been formed with 500 shares no par value common stock to manufacture marine engines for power boats. James McIntosh is president, Philmore Haber, secretary, George P. Narchman, treasurer, B. B. Eisenberg, director and Bernard Brady, director. Mr. McIntosh has designed and improved type 2-cycle engine an evolution of another engine which he designed.

COLUMBUS, O.—Smith Bros. Hardware Co., 23 West Chestnut street, has retained Snyder, Babbitt & Mathews, 1212 Hayden building, as architects, for 6-story, reinforced concrete and brick building, 140x200 feet at Poplar and Fourth streets.

CUYAHOGA HEIGHTS, O.—Western Reserve Steel Co. has been organized with 1500 shares no par value stock, by Tracy H. Duncan, T. C. Robinson and Joseph A. Schlitz.

DENNISON, O.—The chamber of commerce has endorsed a plan to merge the Dennison Foundry Co. and the Resistant Alloy Steel Co., New Cumberland, W. Va. The Dennison plant has been idle for about a year.

LYNN, O.—Sprague Breed-Stevens & Newhall, Central square, are taking bids for a 1-story, 70x140-foot repair and service garage. Sanborn and Weed, Item building, are architects.

SANDUSKY, O.—Pittsburgh Construction Co. has been awarded contracts for constructing a new dock and car loading machine for the Pennsylvania railroad at its local docks.

TODEDO, O.—The Utility Tool, Die & Stamping Co., Inc., has been incorporated with 500 shares no par value stock and $60,000 preferred stock, by Charles E. Bullock, Curtis T. Johnson, Ben W. Johnson, John C. Cochrane and J. Farber.

PHILADELPHIA—Bids will be received shortly by Ellen Bullock, architect, on a 3-story brick warehouse to be erected in Kensington.

PHILADELPHIA—The Acme Brass Foundry Co. will start work shortly on the erection of a small foundry at American and Bristol streets.

PHILADELPHIA—A new addition will be erected by S. S. Fretz Jr. & Co., Twenty-third and Sidgley streets, at their branch plant near Boyerstown. The company manufactures steam fitter's supplies.

PHILADELPHIA—Work will be started at once by the A. H. Fox Gun Co., Eighteenth street and Wagner, on the erection of a $175,000 plant. Clarence E. Wunder is architect. *Noted Nov.* 27.

PHILADELPHIA—Plans have been completed by E. A. Wightman, architect, for a plant addition for the Simplex Valve & Heater Co., Sixty-eighth street and Upland Avenue. *Noted Nov.* 13.

READING, PA.—The Parrish Mfg. Corp., manufacturer of pressed steel automobile frames has awarded a contract for the erection of a new plant. When work is completed, the company will transfer its operations from its present location in the Reading railroad's old shops, which site eventually will be abandoned.

PROVIDENCE, R. I.—The Premier Hardware Mfg. Co. has been incorporated with 1000 shares no par value stock to manufacture and deal in hardware and metal products, by H. Barton Bryer, Simon Silverman, Gilbert Houston, Jr., Henrly L. Crepeau and James W. Houston.

BELOIT, WIS.—Plans have been prepared for a $150,000 vocational high school, by Merman & Skogstad, LaCrosse, Wis., architects. Construction of the 2-story, 100x200-foot building is to begin in January. A. G. McCreary is chairman of the vocational board.

MADISON, WIS.—C. B. Fritz & Co. have taken the general contract to build an $85,000 garage and repairshop, 2-story, 80 x 185 feet, for the Jacobson Auto Co., 207 East Washington street. Architect Edward Tough is now letting remaining contracts.

MILWAUKEE—E. J. Byerelein, owner of the Milwaukee Foundry Equipment Co., 57 Erie street, has incorporated the firm under the laws of Wisconsin, using the present name. The capital is $25,000 preferred and 1500 shares of no-par common stock.

MILWAUKEE—Articles of incorporation have been filed by the Peterson & Janssen Cutting Die Co., capital stock $5000 to make cutting dies for leather, paper and textiles. The incorporators are W. J. Peterson, Henry Janssen and Fred Froede, Third street and North avenue.

MILWAUKEE—Maynard Steel Casting Co., Layton boulevard, has started work on a foundry addition to be 71 x 77 x 100 feet, 2-story, of brick and steel. Gurda & Gurda, 448 Mitchell street, are architects. S. J. Wabiszewski is president and Frank W. Wabiszewski is general manager. *Noted Nov.* 20.

MILWAUKEE—Boehck Machine Co., Inc., dealer in industrial machinery, machine tools, etc., is constructing a large new warehouse, office and machine service shop building at Twenty-fourth and Clybourn streets, at $35,000 cost. Richard E. Boehck is president and general manager.

MILWAUKEE—Milwaukee Corrugating Co. plans immediate enlargement of its works here. A group of buildings were acquired recently at LaCrosse, Wis., and converted into a branch plant, warehouse and distributing depot. A similar plant is operated in Kansas City, Mo. The general contract for the New Milwaukee plant has been awarded Klug & Smith, Mack Block.

Business in Canada

BOSTON CREEK, ONT.—The Barry-Hollinger Co., has completed plans for the erection of a milling plant to have a capacity of 50 tons per day and to cost $50,000.

BRANTFORD, ONT.—The Canada Carriage & Body Co., Ltd., has been incorporated to manufacture carriages, automobiles, trucks, automobile bodies, implements, etc., with $750,000 capital stock; by John W. Cook, Allan A. Magee, Theodore B. Heney and others all of Montreal, Que., as provisional directors.

KIRKLAND LAKE, ONT.—The Lake Shore Mining Co., proposes to build addition to milling plant to increase capacity from 300 to 500 tons per day at a cost of $200,000.

LARDER LAKE, ONT.—The Crown Reserve Mining Co., will build addition to its milling plant here to cost $200,000.

PORCUPINE, ONT.—McIntyre Mines, Ltd., is having plans prepared for addition to milling plant and the installation of additional equipment to cost $2,000,000.

ST. CATHARINES, ONT.—The Canadian National railways will build new car and paint shops here to cost $25,000. The new plant will be utilized for general repair work on lines from Toronto to Niagara Falls.

ST. CATHARINES, ONT.—Campbell's Hardware, Ltd., has been incorporated to manufacture hardware, tools, etc., with $40,000 capital stock; by Alan S. Notman, Ina I. Campbell and others.

ST. CATHARINES, ONT.—The W. J. Elliott Tool Co., Ltd., has been incorporated to acquire and take over the plant and business of the J. H. Williams & Co. Ltd., here, and to manufacture drop-forgings, tools, machinery, implements, etc., with $1,000,000 capital stock; by William J. Elliott, William B. Elliott, George B. Burson and others.

TORONTO, ONT.—The Hoyt Metal Co., Eastern avenue, has awarded contracts and started excavation work on new plant to cost $200,000. *Noted Nov.* 27.

TORONTO, ONT.—The Antiscale Corp. of Canada, Ltd., has been incorporated to manufacture boilers, mechanical devises, apparatus for removing scale from boilers, etc., with $50,000 capital stock; by Albert E. Knox, George Keogh, Edward L. Middleton and others.

TORONTO, ONT.—The M. S. P. Co., Ltd., has been incorporated to manufacture iron, steel and other metals from ore to the finished product; wire, shingle bands, wire products, etc., with $50,000 capital stock; by James M. Pickering, John D. Hanlan, George H. Murphy and others.

TORONTO, ONT.—Newton Conley, Ltd., has been incorporated to acquire and take over the plant and business of Newton Herbert Conley, to manufacture pianos, parts, musical instruments, etc., with $50,000 capital stock; by Newton H. Conley, James H. Bone, Wilfred J. P. Jenner and others.

WELLAND, ONT.—Work is expected to begin within 30 days on the construction of section seven of the Welland canal. Canadian Dredging Co. was awarded the bid at $10,000,000. Various equipment probably will be required for the work.

MONTREAL, QUE.—Superior Bolt & Screw Co., Ltd., has been incorporated to manufacture bolts, screws, machinery, tools, etc., with $350,000 capital stock; by Alexander Chevalier, John E. Crankshaw, Edmon E. Genest and others.

MONTREAL, QUE.—Yellow Cab Co. of Montreal, Ltd., has been incorporated to manufacture and deal in automobiles, trucks, etc., with $1,000000 capital stock; by George A. Campbell, Margaret Hartley Lillian M. Gallagher and others as provisional directors.

MONTREAL QUE.—The Central Quebec Light & Power Co., Ltd. has been incorporated to build and operate electric light and power development plants, etc., with $350,000 capital stock; by Charles A. Barnard, William K. McKeown, Berthe Charlebois and others.

Iron and Steel Prices

Nuts and Bolts

F.o.b. Producer's Plant

Hot pressed square tapped or blank .....$4.00 off list
Hot pressed hexagon tapped or blank .....$4.40 off list
Cold punched square or hexagon blank .....$4.10 off list
Cold punched square or hexagon tap- .....$4.10 off list
Cold punched semifinished hexagon nuts ½-inch and larger ....75, 10 and 5 off
Cold punched semifinished hexagon nuts 9/16-inch and smaller..80, 10 and 5 off
Price f.o.b. Pittsburgh, packages of 50.

CARRIAGE BOLTS

(½ x 6", smaller and shorter)

Rolled thread .....50, 10 and 10 off
Cut thread (all sizes) .....50 and 10 off

MACHINE BOLTS

(½ x 4", hot pressed nuts)

Rolled thread .....60 and 10 off
Cut thread (all sizes) ....50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread .....45, 10 and 5 off
Lag screws .....60, 10 and 10 off
Plow bolts Nos. 1, 2 and 3 heads.. ..... 50 and 10 off
4 to 10 heads .....50-10 + 20 off
Flat and round head stove bolts .....80, 10 and 5 off
Other stove bolts .....80, 10 and 10 off
Tap bolts .....30 off
Bolt ends with hot pressed nuts .....50, 10 and 10 off
Bolt ends with cold punched nuts .....45, 10 and 5 off
Blank bolts .....50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size) .....40 and 10 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000, Pittsburgh and Chicago

	S. A. E. Castellated	U. S. S. Slotted
¼	$ 4.25	$ 4.25
5/16	4.90	4.90
⅜	5.90	6.25
7/16	7.50	8.50
½	9.75	10.00
9/16	13.25	13.50
⅝	16.25	16.50
¾	22.50	23.00
⅞	34.00	34.00
1	53.00	55.00
1⅛	85.00	85.00
1¼	120.00	125.00
1⅜	170.00	170.00
1½	200.00	200.00

Larger sizes—Prices on application.

HEXAGON CAP AND SET SCREWS

Milled .....85 and 10 off
Upset .....85, 10, 10 and 5 off

Rivets

Structural rivets, carloads Pittsburgh and Cleveland.. 2.60c
Structural rivets, carloads, Chicago 2.75c
Rivets, 7/16-in. and smaller Pittsburgh and Cleveland..70, 10 and 5 off
Rivets, 7/16-in. and smaller Chicago .....70, 10 off

Washers

Wrought, c. l., Chicago dist. $5.75 to $6.15 off
Wrought, c. l., Pitts. dist.....$6.00 off
Lock washers f.o.b. factory .....80 off

Steel Pipe

Pittsburgh and Lorain basing discounts, jobbers' carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount or $4 per ton higher net.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis or $5 per ton higher net.

Butt Beld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis

THREADS AND COUPLINGS

Butt Weld

⅛ and ¼-inch	+11	+39
⅜-inch	22	2
½-inch	28	11
¾-inch	30	13
1 to 1½-inch		

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 8-inch	28	13
9 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

Butt Weld

⅛ and ¼-inch	+19	+54
⅜-inch	21	7
½-inch	28	12
¾-inch	30	14
1 to 1½-inch		

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

⅛-inch	+47½	+59½
¼-inch	+28	+40
½-inch	+34	+40
¾-inch	+28	+40
1 to 1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¼ to 4½-inch	5

SEAMLESS COLD DRAWN*

1-inch	51 off
1¼ and 1½-inch	43 off
1¾-inch	27 off
2 and 2¼-inch	18 off
2½ and 2¾-inch	28 off
3 and 3¼-inch	32 off
3½ and 3¾-inch	33 off
4-inch	37 off
4½ and 5-inch	29 off

SEAMLESS HOT HOLLED*

3 and 3¼-inch	34 off
3½ and 3¾-inch	35 off
4-inch	39 off

SEAMLESS STEEL MERCHANT BOILER TUBES*

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING*

Base Discounts

Carbon, 0.10 to 0.20 per cent ..... 83 off
Carbon, 0.30 to 0.40 per cent .... 81 off
Carbon, 0.40 to 0.50 per cent ....net price
Plus differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES*

Outside diameter	Gage	Net prices per foot f.o.b. Pittsburgh Price
2-inch	12-gage	15c
2-inch	12-gage	15c
2-inch	11-gage	16c
2-inch	10-gage	17c
2¼-inch	12-gage	17c
2¼-inch	11-gage	18c
2¼-inch	10-gage	20c
3-inch	7-gage	35c
1½-inch	9-gage	15c
5¾-inch	9-gage	55c
5½-inch	9-gage	57c

Plus usual extras for forming and for long lengths.

*Published discounts are subject to considerable shading, in some cases as much as three to five extra 5 per cents.

Cast Iron Water Pipe

Prices per net ton

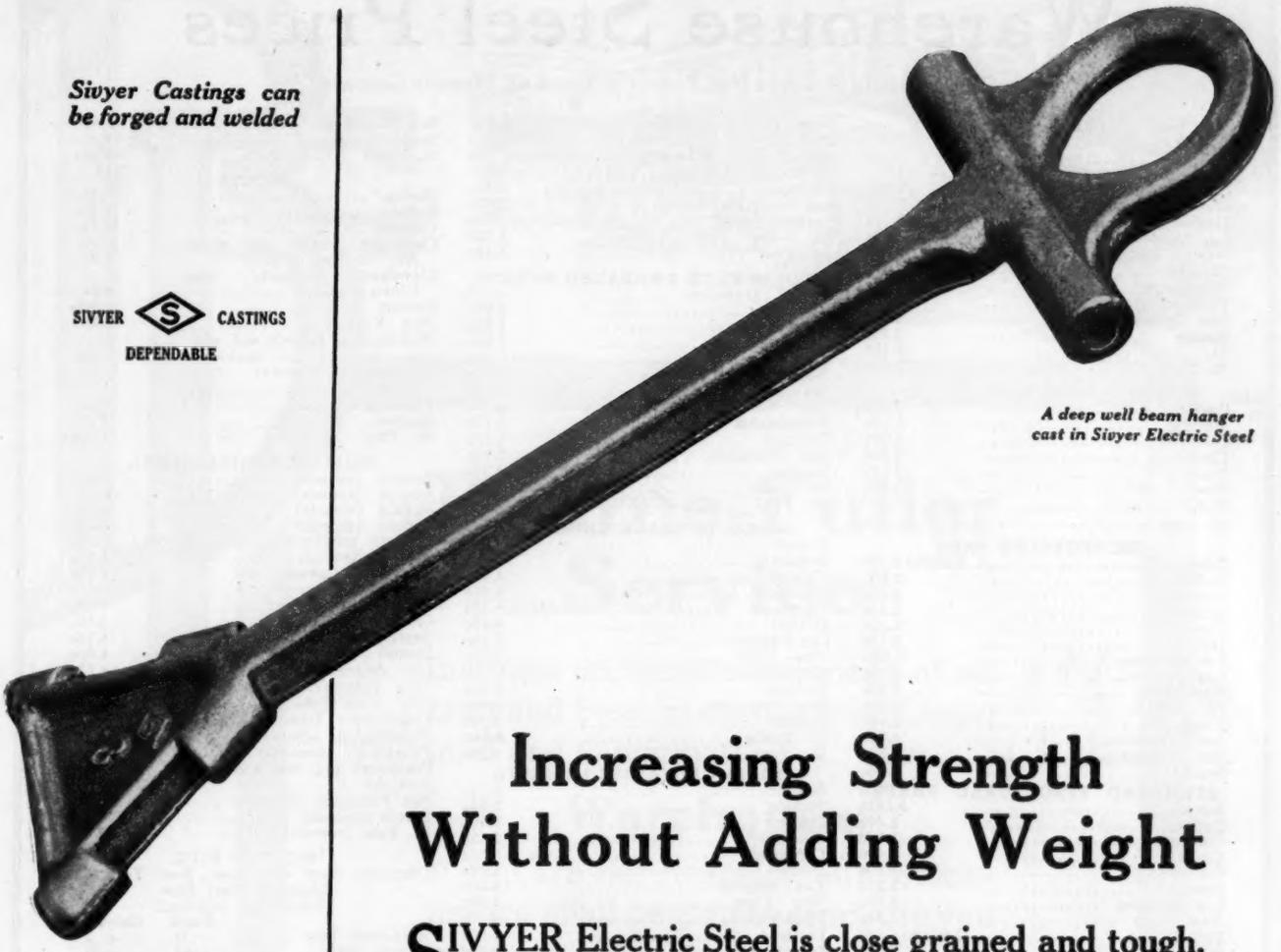
Class B Pipe

Four-inch, Chicago	51.20 to 52.20
Six-inch and over, Chicago	47.20 to 48.20
Four-inch, Birmingham	44.00 to 44.50
Six-inch and over Birmingham	40.00 to 40.50
Four-inch, New York	60.50 to 61.60
Six-inch and over, New York	55.50 to 56.60

Standard fittings, Birmingham, base..$110.00
6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.
Class A pipe is $5 higher than Class B.

Sivyer Castings can be forged and welded

SIVYER CASTINGS
DEPENDABLE



A deep well beam hanger cast in Sivyer Electric Steel

Increasing Strength Without Adding Weight

SIVYER Electric Steel is close grained and tough. This permits the casting of parts, similar to the one pictured, without adding bulk or weight to provide the required exceptional strength. This particular part, for example, is called upon to bear heavy strains as a deep well beam hanger. Yet, it is highly desirable that it be light in weight. Forging of the part is impractical because of its design. By casting the hanger in Sivyer Electric Steel extremely satisfactory field results have been obtained. The manufacturer using the part feels safe in guaranteeing it to be practically unbreakable. On the other hand, the weight of the hanger with its assembly is but 103 pounds—light enough to be easily handled.

Send Blue Prints

In this case, as in so many others, the toughness of Sivyer Electric Steel has enabled a manufacturer to provide parts of great strength without sacrificing light weight. The inherent strength of Sivyer Electric Steel plus the excellent annealing practice of the Sivyer foundry—where the castings are grouped for annealing according to the heat treatment that they require—gives Sivyer Castings a close-grained toughness that minimizes breakage and wear.

If you are having trouble with forged parts that fail to stand up as well as you expect them to, or if you are using parts to which extra weight has had to be added to provide the desired strength, Sivyer Electric Steel Castings may solve your problem. If you will send us blue prints of the part with a statement of your difficulties we will be glad to recommend possible solutions without obligation on your part.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

Warehouse Steel Prices

Quotations at Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.10c
Detroit	3.15c
Los Angeles	3.00c
New York	3.24c
Philadelphia	3.20c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	2.85c
Seattle	3.25c
St. Louis	3.15c
St. Paul	3.25c

IRON BARS

Boston	3.265c
Buffalo	3.35c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
New York	3.24c
Philadelphia	3.20c
St. Louis	3.15c

REINFORCING BARS

Boston	3.25c to 3.50c
Buffalo	3.40c
Chicago	2.60c
Cincinnati	3.30c
Cleveland	3.10c
Detroit	3.15c
Los Angeles, C. L.	3.60c
Los Angeles, L. C. L.	4.00c
New York	2.80c
Philadelphia	2.80c
Pittsburgh	2.25c to 2.40c
San Francisco, C. L.	3.35c
San Francisco, L. C. L.	3.80c
Seattle	3.50c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.20c
Detroit	3.25c
Los Angeles	3.00c
New York	3.34c
Philadelphia	2.90c to 3.10c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.00c
Seattle	3.35c
St. Louis	3.25c
St. Paul	3.35c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.20c
Cleveland, 3/16-inch	3.425c
Detroit	3.20c
Detroit, 3/16-inch	3.45c
Los Angeles	3.00c
New York	3.34c
Philadelphia	2.90c to 3.10c
Philadelphia, 3/16-inch	3.06c to 3.26c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.00c
Seattle	3.25c
St. Louis	3.25c
St. Paul	3.35c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	3.915c
Buffalo	4.05c
Chicago	3.80c
Cincinnati	3.90c
Cleveland	3.45c to 3.76c
Detroit	3.95c
Los Angeles	4.05c
New York	3.89c
Philadelphia	3.75c
Portland	4.50c
San Francisco	3.95c
Seattle	4.50c
St. Louis	3.90c
St. Paul	4.05c

NO. 28 BLACK SHEETS

Boston	5.10c
Buffalo	4.75c
Chicago	4.50c
Cincinnati	4.55c
Cleveland	4.35c to 4.55c
Detroit	4.65c
Los Angeles	5.15c
New York	4.60c
Philadelphia	4.85c
Portland	5.00c
San Francisco	5.00c
Seattle	5.50c
St. Louis	4.65c
St. Paul	4.85c

NO. 28 GALVANIZED SHEETS

Boston	6.15c
Buffalo	5.85c
Chicago	5.50c
Cincinnati	5.65c
Cleveland	5.45c to 5.65c
Detroit	5.75c
Los Angeles	6.00c
New York	5.60c
Philadelphia	6.00c
Portland	6.00c
San Francisco	5.90c
Seattle	6.50c
St. Louis	5.65c
St. Paul	5.65c to 5.90c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.85c
Detroit	3.80c
Los Angeles	4.00c
New York	3.99c
Philadelphia	3.95c
Pittsburgh	3.60c
Portland	4.00c
San Francisco	3.60c
Seattle	4.25c
St. Paul	3.90c

HOOPS

Boston	5.50c
Buffalo	4.40c
Chicago	4.15c
Cleveland, 1-inch and wider	
No. 20 and heavier	3.85c
Cleveland, narrower than 1-inch	4.35c
Detroit	4.30c
New York	4.49c
Philadelphia, ¼-inch and wider, 20 gage and heavier	3.95c
Philadelphia—narrower than ¼-inch	4.45c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	4.70c

COLD FINISHED STEEL

Boston (shapes)	4.55c
Boston (rounds)	4.05c
Buffalo (rounds)	4.20c
Buffalo (shapes)	4.70c
Chicago (shapes)	4.30c
Chicago (rounds)	3.80c
Cincinnati (rounds)	4.05c
Cincinnati (shapes)	4.55c
Cleveland (rounds	4.00c
Cleveland (shapes)	4.50c
Detroit (rounds)	4.10c
Detroit (shapes)	4.60c
Los Angeles (rounds)	4.75c
New York (rounds)	4.15c
New York (shapes)	4.65c
Philadelphia (rounds)	4.05c
Philadelphia (shapes)	4.55c
Pittsburgh (rounds)	3.80c
Pittsburgh (sq. hex. and flats)	4.30c
Portland	4.50c
San Francisco (rounds)	5.25c
Seattle (rounds)	4.75c
St. Paul (rounds)	4.05c

WELDED PIPE

Discounts from warehouse, New York City

Standard Steel Pipe
(Subject to Shading)

	Black	Galvanized
⅛-⅜-inch butt	—31	+ 2
½-inch butt	—41	—24
¾-inch butt	—46	—32
1/3-inch butt	—48	—34
3½-inch lap	—44	—30
7-8-inch lap	—41	—11
9-10-inch lap	—35	— 8
11-12-inch lap	—34	— 6

Wrought Iron Pipe

	Black	Galvanized
⅛-⅜-inch butt	+44	+78
½-inch butt	— 4	+19
¾-inch butt	—11	+ 9
1-1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
3-6-inch lap	—11	+ 6
7-12-inch lap	— 3	+16

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 55 per cent iron	$5.65
Mesabi bessemer, 55 per cent iron	5.40
Old Range nonbessemer, 51½ per cent iron	4.90
Mesabi nonbessemer, 51½ per cent iron	4.75

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.00
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.50 to 10.00
Algerian low phosphorus, 52 to 54 per cent	10.50 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 66 to 68 per cent	9.00 to 10.00
Spanish foundry or basic, 50 to 54 per cent	8.00 to 9.00
Algerian foundry and basic, 50 to 54 per cent	8.00 to 9.00

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum 47 per cent....nominal
Indian, minimum 47 per cent....nominal
Caucasian, 53 to 55 per cent....
.....Ordinary, nominal c.i.f. tidewater
.....Washed, 42 cents c.i.f. tidewater

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$17.50 to 21.50
Washed gravel, imported duty paid eastern tidewater, per net ton	17.50 to 18.50

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for Special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke
CLEVELAND

New York **Chicago**
San Francisco
Cincinnati **Detroit**

Iron and Steel Production

Compiled By IRON TRADE REVIEW

Pig Iron

	-Stacks- No.	In	—Output— Total	Av. daily
1907				
January	376	311	2,174,801	70,155
February	374	308	2,047,036	73,109
March	377	304	2,186,709	70,539
April	378	327	2,226,708	74,223
May	391	329	2,291,030	73,904
June	392	341	2,237,420	74,580
July	396	335	2,253,243	72,685
August	397	329	2,243,656	72,376
September	399	329	2,174,148	72,471
October	401	314	2,359,690	76,119
November	398	226	1,820,558	60,685
December	398	154	1,234,733	39,830
Total			25,249,732	
1908				
January	398	139	1,081,813	34,897
February	401	150	1,086,809	37,476
March	398	154	1,229,856	39,672
April	398	146	1,155,122	38,504
May	396	145	1,168,002	37,677
June	395	154	1,106,300	36,876
July	397	166	1,228,604	39,632
August	399	181	1,366,019	44,065
September	399	189	1,416,252	47,208
October	400	200	1,573,824	50,764
November	402	212	1,582,314	52,744
December	403	221	1,723,664	55,602
Total			15,718,579	
1909				
January	406	234	1,787,473	57,683
February	407	233	1,682,470	60,088
March	406	229	1,822,024	58,793
April	406	224	1,731,406	57,687
May	407	236	1,866,757	60,218
June	408	240	1,929,929	64,334
July	409	258	2,088,620	67,375
August	412	278	2,232,642	72,021
September	413	297	2,378,655	79,201
October	413	309	2,589,681	83,538
November	414	311	2,532,740	84,425
December	416	314	2,682,702	86,539
Total			25,325,099	
1910				
January	416	311	2,599,995	83,871
February	417	311	2,429,525	86,768
March	417	310	2,588,736	83,508
April	418	291	2,477,700	82,590
May	419	279	2,374,802	76,607
June	420	271	2,288,279	76,276
July	420	254	2,158,124	69,617
August	422	244	2,103,791	67,864
September	420	234	2,048,461	68,282
October	421	230	2,086,205	67,297
November	421	218	1,910,385	63,679
December	421	193	1,779,899	57,416
Total			26,845,902	
1911				
January	421	210	1,766,658	56,985
February	421	226	1,781,285	63,617
March	421	236	2,165,764	69,863
April	421	220	2,044,904	68,163
May	421	206	1,871,888	60,367
June	421	202	1,773,282	59,109
July	423	196	1,776,108	57,294
August	423	206	1,921,832	61,995
September	423	216	1,973,918	65,797
October	421	214	2,092,061	67,486
November	421	214	1,999,100	66,637
December	422	215	2,032,301	65,558
Total			23,198,601	
1912				
January	421	227	2,052,806	66,220
February	422	235	2,098,796	72,372
March	420	237	2,411,529	77,791
April	421	239	2,377,621	79,254
May	423	243	2,503,341	80,753
June	424	242	2,433,737	81,125
July	422	245	2,402,567	77,502
August	423	255	2,500,163	80,650
September	419	262	2,444,454	81,482
October	422	280	2,683,645	86,569
November	423	289	2,639,562	87,985
December	423	291	2,777,292	89,590
Total			29,325,513	
1913				
January	423	297	2,787,800	89,929
February	423	306	2,578,670	92,095
March	423	278	2,762,823	89,123
April	421	297	2,754,353	91,812
May	421	285	2,816,825	90,865
June	422	283	2,616,883	87,229
July	422	264	2,558,275	82,525
August	424	260	2,537,018	81,839
September	425	258	2,494,098	83,137
October	425	244	2,539,924	81,933
November	424	225	2,229,960	74,322
December	424	191	1,976,138	63,746
Total			30,652,767	
1914				
January	423	199	1,879,336	60,624
February	423	219	1,888,607	67,450
March	423	232	2,341,551	75,534
April	422	212	2,261,501	75,383
May	422	198	2,097,019	67,646
June	422	193	1,904,566	63,486
July	422	187	1,955,324	63,075
August	422	187	1,996,483	64,403
September	422	180	1,882,718	62,757
October	422	162	1,767,227	57,007
November	421	150	1,501,269	50,042
December	421	154	1,495,325	48,236
Total			22,970,926	
1915				
January	421	165	1,591,024	51,323
February	421	179	1,666,592	59,521
March	421	190	2,046,280	66,009
April	421	197	2,114,518	70,484
May	421	207	2,255,157	72,747
June	421	221	2,369,932	78,998
July	421	234	2,563,311	82,687
August	421	246	2,774,825	89,510
September	420	266	2,834,342	94,478
October	420	276	3,120,340	100,656
November	421	285	3,035,235	101,174
December	421	295	3,201,605	103,278
Total			29,573,161	
1916				
January	421	304	3,171,878	102,319
February	421	312	3,078,548	106,157
March	422	315	3,327,630	107,343
April	422	320	3,225,496	107,517
May	423	321	3,364,584	108,535
June	423	325	3,213,818	107,127
July	419	316	3,221,127	103,907
August	419	317	3,197,838	103,156
September	419	326	3,208,041	106,935
October	419	328	3,508,180	113,167
November	420	322	3,317,805	110,593
December	422	309	3,184,178	102,715
Total			39,019,123	
1917				
January	422	310	3,159,839	101,930
February	422	317	2,649,935	94,641
March	423	331	3,255,813	105,026
April	425	333	3,328,061	110,936
May	425	340	3,413,677	110,119
June	427	347	3,260,234	108,675
July	429	351	3,337,442	107,659
August	431	357	3,238,970	104,483
September	431	342	3,140,742	104,691
October	433	354	3,296,286	106,332
November	434	344	3,198,597	106,620
December	435	321	2,885,380	93,077
Total			38,164,976	
1918				
January	435	294	2,403,227	77,523
February	435	319	2,318,242	82,723
March	438	338	3,209,996	103,548
April	437	351	3,273,355	109,112
May	437	360	3,451,884	111,351
June	437	353	3,316,148	110,538
July	437	364	3,408,584	109,954
August	439	371	3,378,479	108,983
September	438	364	3,413,223	113,774
October	437	364	3,482,392	112,335
November	437	360	3,347,844	111,595
December	435	351	3,434,114	110,778
Total			38,437,488	
1919				
January	435	330	3,306,279	106,654
February	435	311	2,943,347	105,120
March	435	279	3,088,023	99,614
April	435	216	2,474,374	82,479
May	433	197	2,107,729	67,991
June	433	199	2,114,028	70,467
July	434	240	2,424,212	78,200
August	432	266	2,742,081	88,453
September	433	163	2,480,790	82,692
October	432	216	1,864,424	60,142
November	432	252	2,407,369	80,244
December	432	262	2,626,074	84,711
Total			30,578,730	
1920				
January	432	285	3,012,373	97,172
February	432	305	2,984,257	102,904
March	433	315	3,375,768	108,895
April	433	278	2,752,670	91,754
May	433	297	2,991,825	96,510
June	433	302	3,046,623	101,553
July	434	291	3,043,918	98,190
August	434	306	3,145,536	101,468
September	434	317	3,124,308	104,143
October	435	290	3,288,341	106,075
November	435	255	2,935,081	97,836
December	435	202	2,700,268	87,105
Total			36,400,968	
1921				
January	436	184	2,414,753	77,895
February	436	155	1,929,394	68,906
March	436	103	1,594,866	51,447
April	436	96	1,190,751	39,691
May	436	90	1,215,272	39,202
June	436	74	1,064,007	35,466
July	435	69	864,642	27,892
August	436	69	954,901	30,802
September	435	84	985,795	32,859
October	435	95	1,234,450	39,821
November	429	120	1,414,958	47,165
December	429	123	1,642,775	52,992
Total			16,506,564	
1922				
January	430	127	1,645,804	53,090
February	429	139	1,630,180	58,220
March	429	155	2,035,908	65,674
April	429	161	2,070,161	69,005
May	427	175	2,309,348	74,495
June	427	191	2,362,455	78,748
July	427	170	2,403,030	77,517
August	427	143	1,810,665	58,408
September	427	189	2,024,008	67,466
October	428	218	2,629,655	84,827
November	428	241	2,846,110	94,870
December	428	253	3,083,520	99,468
Total			26,850,844	
1923				
January	428	261	3,228,226	104,136
February	424	278	2,993,918	106,925
March	424	295	3,523,595	113,664
April	423	311	3,547,012	118,233
May	423	322	3,868,486	124,790
June	424	322	3,667,868	122,262
July	418	299	3,684,677	118,860
August	418	270	3,448,886	111,254
September	418	254	3,117,526	103,917
October	418	245	3,142,642	101,375
November	418	229	2,891,191	96,373
December	418	231	2,912,527	93,952
Total			40,025,850	
1924				
January	414	248	3,015,480	97,273
February	414	263	3,072,169	105,937
March	410	269	3,465,389	111,787
April	410	234	3,226,107	107,537
May	411	187	2,619,986	84,515
June	411	158	2,022,836	67,427
July	411	145	1,783,457	57,531
Aug.	411	150	1,882,986	60,741
Sept.	411	174	2,053,617	68,454
Oct.	411	182	2,461,727	79,410
Nov.	411	204	2,513,247	83,775

Ingots and Castings

By American Iron and Steel Institute

	Ingots	Castings	Total
1920	40,881,392	1,251,542	42,132,934
1921	19,184,084	559,713	19,743,797
1922	34,568,418	1,034,508	35,602,926
1923	43,485,665	1,458,031	44,943,696

Monthly Ingot Output

1923	Gross Tons 94.84 per cent of capacity	Calculated total
January	3,644,629	3,841,095
February	3,294,264	3,471,843
March	3,858,675	4,066,680
April	3,760,997	3,963,736
May	4,000,695	4,216,355
June	3,574,567	3,767,256
July	3,350,829	3,531,458
August	3,506,755	3,695,788
September	3,185,082	3,356,776
October	3,394,128	3,577,091
November	2,974,005	3,134,321
December	2,716,814	2,863,266
Total	41,261,440	43,485,665
1924	94.84 per cent	
January	3,446,143	3,633,639
February	3,612,631	3,809,185
March	3,971,844	4,187,942
April	3,161,525	3,333,535
May	2,492,643	2,628,261
June	1,950,352	2,056,466
July	1,772,954	1,869,416
August	2,410,360	2,541,501
September	2,669,742	2,814,996
October	2,950,901	3,111,452
November	2,946,893	3,107,226

WABIK METAL

for
Vitreous Enameling

SPLASHER BACKS
Stove Door Panels: Broiler Pans: Table Tops: Refrigerators: Signs: and other Flat Work

Wabik Metal Sheets, like all other Mansfield Products, are rolled from our own "Bottom-poured Ingots." They are very low in sulphur.

Other Specialties:

Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

METAL FURNITURE SHEETS
PICKELED and ANNEALED
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"Mansfield" Steel is the ultimate in Sheet Bars and in Sheets. It means satisfaction to all of the many users. Constant study of the needs of users, and continuous application of the results of such study, in the way of improved methods in our plants has established a reputation for unsurpassed reliability.

We invite your inquiries.

SHEET BARS
and
INGOTS

MANSFIELD SHEET & TIN PLATE COMPANY
MANSFIELD, OHIO

DISTRICT SALES REPRESENTATIVES

L. D. Rockwell Co., 1106 National City Bldg., New York, N. Y.
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Mansfield Sheet & Tin Plate Co., 12-237 General Motors Bldg., Detroit, Mich.
L. D. Rockwell Co., 2002 Union Trust Bldg., Cleveland, O.
Wm. L. Hoffman, 1504 West Venango St., Philadelphia, Pa.
C. H. Beach, 1403 Merchants Bank Bldg., Indianapolis, Ind.
Maynard French Steel Co., 710 Mercantile Library Bldg., Cincinnati, O.
A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 509 Wilcox Bldg., Los Angeles, Cal.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	14.00 to 14.50
Boston (dealers)	14.50 to 15.00
Buffalo	19.00 to 19.50
Chicago	18.25 to 18.75
Cleveland	18.25 to 18.50
Cincinnati (dealers)	15.00 to 15.50
Detroit (dealers)	15.00 to 15.50
Eastern Pennsylvania	19.00 to 21.00
New York (dealers)	15.00 to 16.00
Pittsburgh	21.00 to 21.50
St. Louis	16.50 to 17.00
Valleys	19.50 to 20.50
No. 1 railroad steel New York (dealers)	15.00 to 16.00

COMPRESSED SHEETS

Buffalo	17.50 to 18.00
Chicago	15.50 to 16.00
Cleveland	15.25 to 15.50
Detroit (dealers)	12.50 to 13.00
Pittsburgh	19.50 to 20.00
Valleys	17.25 to 17.75

BUNDLED SHEETS

Buffalo	14.50 to 15.00
Cincinnati (dealers)	11.50 to 12.00
Cincinnati (dealers)	10.50 to 11.00
Cleveland	14.00 to 14.25
Detroit	10.50 to 11.00
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	18.50 to 19.00
St. Louis	13.00 to 13.50
Valleys	15.25 to 15.75

SHEET CLIPPINGS, LOOSE

Chicago	11.00 to 11.50
Detroit	9.50 to 10.00

STEEL RAILS, SHORT

Birmingham	14.00 to 14.50
Detroit, No. 2	14.50 to 15.00
Chicago	20.00 to 20.50
Cincinnati (dealers)	16.00 to 16.50
Cleveland (over 6 ft.)	17.50 to 17.75
St. Louis	19.00 to 19.50

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	14.50 to 15.00
Buffalo	15.00 to 15.50
Chicago	18.00 to 18.50
Cincinnati (dealers)	11.50 to 12.00
Cleveland	15.00 to 15.50
Detroit (net tons) dealers	13.50 to 14.00
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	12.25 to 12.75
Pittsburgh	15.50 to 16.00
St. Louis	16.00 to 16.50

LOW PHOSPHORUS

Buffalo	21.50 to 22.00
Cincinnati (dealers)	17.00 to 17.50
Eastern Pennsylvania	22.00 to 22.50
Pitts. billet and bloom crops	25.50 to 26.00

SHOVELING STEEL

Chicago	18.00 to 18.50
Pittsburgh	15.00 to 15.50
St. Louis	16.50 to 17.00

KNUCKLES, COUPLERS, SPRINGS

Chicago	22.00 to 22.50
Eastern Pennsylvania	20.00 to 20.50
Pittsburgh	23.00 to 23.50
St. Louis	20.50 to 21.00

FROGS, SWITCHES, GUARDS

Chicago	18.25 to 18.75
Eastern Pennsylvania	19.00 to 20.00
St. Louis	18.50 to 19.00

BOILER PLATE, CUT

St. Louis	11.00 to 11.50

ANGLE BARS—STEEL

Buffalo	20.50 to 21.00
Chicago	19.00 to 19.50
St. Louis	18.00 to 18.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	13.00 to 14.00
Boston (dealers)	15.00 to 16.00
Buffalo	18.00 to 19.00
Cleveland, No. 1	16.00 to 16.25
Chicago, No. 1	18.75 to 19.25
Chicago, No. 2	18.25 to 18.75
Cincinnati, No. 1 (dealers)	13.00 to 13.50
Detroit, No. 2	15.00 to 15.50
Eastern Pennsylvania	19.00 to 20.00
New York, No. 1 (dealers)	16.00 to 16.50
Pittsburgh, No. 1	17.00 to 17.50
Pittsburgh, No. 2	21.00 to 21.50
St. Louis, No. 1	16.75 to 17.25
St. Louis, No. 2	17.00 to 17.50

WROUGHT PIPE

Boston (dealers)	12.50 to 13.00
Buffalo	14.00 to 14.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	13.25 to 13.75

YARD WROUGHT

Boston	14.50 to 15.00
Eastern Pennsylvania	17.00 to 18.00

CITY WROUGHT

New York, long	14.00 to 14.50

BUSHELING

Buffalo	17.00 to 17.50
Chicago, No. 1	16.25 to 16.75
Chicago, No. 2	10.50 to 11.00
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	16.00 to 16.25
Cleveland, No. 2	14.25 to 14.75
Detroit, No. 1	12.00 to 12.50
Detroit, No. 2 (new)	11.00 to11.50
Detroit, No. 2 (old)	10.50 to 11.00
Eastern Pennsylvania	14.50 to 15.00
Pittsburgh, No. 1	17.00 to 17.50
St. Louis, No. 1	16.75 to 17.25

MACHINE SHOP TURNINGS

Birmingham	7.00 to 8.00
Boston (dealers)	11.50 to 12.00
Buffalo	14.00 to 14.50
Chicago	11.50 to 12.00
Cincinnati (dealers)	11.50 to 12.00
Cleveland	15.50 to 15.75
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	16.50 to 17.00
New York (dealers)	12.00 to 12.50
Pittsburgh	17.50 to 18.00
St. Louis	9.50 to 10.00
Valleys	15.25 to 15.50

CAST IRON BORINGS

Birmingham (chemical)	15.00 to 16.00
Birmingham (plain)	7.00 to 8.00
Boston (chemical)	14.50 to 15.00
Boston (dealers)	10.50 to 11.00
Buffalo	14.50 to 15.00
Chicago	14.00 to 14.50
Cincinnati (dealers)	11.50 to 12.00
Cleveland	16.25 to 16.50
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania (chem.)	20.00 to 21.00
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	10.75 to 11.25
Pittsburgh	17.00 to 17.50
St. Louis	12.00 to 12.50
Valleys	16.25 to 16.50

MIXED BORINGS AND TURNINGS
For blast furnace use

Boston (dealers)	9.50 to 10.00
Detroit (dealers)	11.50 to 12.00
Eastern Pennsylvania	13.00 to 14.00
New York (dealers)	9.75 to 10.25
Pittsburgh	15.00 to 15.50

IRON AXLES

Birmingham	18.00 to 18.50
Boston (consumers)	31.00 to 32.00
Buffalo	26.50 to 27.00
Chicago	29.50 to 30.00
Cincinnati (dealers)	22.50 to 23.00
Eastern Pennsylvania	28.00 to 30.00
St. Louis	27.50 to 28.00

IRON RAILS

Buffalo	18.00 to 18.50
Chicago	19.00 to 19.50
Cincinnati (dealers)	13.00 to 13.50
St. Louis	18.00 to 18.50

PIPES AND FLUES

Chicago	14.50 to 15.00
Cincinnati (dealers)	9.50 to 10.00
Cleveland	14.00 to 14.50
St. Louis	12.50 to 13.00

RAILROAD GRATE BARS

Buffalo	15.50 to 16.00
Chicago	18.00 to 18.50
Cleveland	15.00 to 15.50
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	13.00 to 13.50
St. Louis	16.50 to 17.00

FORGE FLASHINGS

Boston (dealers)	11.50 to 12.00
Buffalo	15.00 to 15.50
Chicago	14.00 to 14.50
Cleveland (under 10 in.)	15.50 to 15.75
Cleveland (over 10 in.)	14.00 to 14.25
Detroit (dealers)	11.50 to 12.00
Pittsburgh	16.00 to 16.50

FORGE SCRAP

Boston (dealers)	11.50 to 12.00
Chicago	21.50 to 22.00
Eastern Pennsylvania	16.00 to 16.50

ARCH BARS AND TRANSOMS

Chicago	23.50 to 24.00
St. Louis	22.00 to 22.50

ANGLE BARS—IRON

Chicago	20.50 to 21.00
St. Louis	21.50 to 22.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	11.50 to 12.00
Buffalo	15.00 to 15.50
Chicago	16.50 to 17.00
Cleveland	16.25 to 16.50
Eastern Pennsylvania	17.50 to 18.00
Pittsburgh	17.50 to 18.00
St. Louis	13.00 to 13.50

STEEL CAR AXLES

Birmingham	17.50 to 18.00
Boston (consumers)	20.00 to 20.50
Buffalo	22.00 td 22.50
Chicago	22.00 to 22.50
Cleveland	19.00 to 19.50
Eastern Pennsylvania	25.00 to 26.00
Pittsburgh	21.50 to 22.00
St. Louis	22.00 to 22.50

SHAFTING

Boston (consumers)	21.00 to 21.50
Chicago	22.00 to 22.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	18.50 to 19.50
St. Louis	20.00 to 20.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	16.00 to 17.00
Birmingham, iron	15.00 to 16.00
Boston (consumers)	17.50 to 18.00
Buffalo	18.50 to 19.00
Chicago, iron	19.50 to 20.00
Chicago, steel	21.50 to 22.00
Cincinnati	13.00 to 13.50
Eastern Pennsylvania	19.00
New York iron (dealers)	14.75 to 15.25
Pittsburgh, iron	20.00 to 20.50
Pittsburgh, steel	23.00 to 23.50
St. Louis, iron	18.00 to 18.50
St. Louis steel	20.50 to 21.00

NO. 1 CAST SCRAP

Birmingham, cupola	16.00 to 17.00
Boston (consumers)	19.50 to 20.00
Buffalo	18.25 to 18.75
Chicago, No. 1 machinery	20.75 to 21.25
Chicago No. 1 railroad or agricultural	19.50 to 20.00
Cincinnati No. 1 machinery cupola (net tons dealers)	19.00 to 19.50
Cleveland, cupola	19.50 to 20.00
Detroit (net tons) (dealers)	15.50 to 16.00
Eastern Pennsylvania, cupola	20.00
New York, cupola (dealers)	15.25 to 15.75
Pittsburgh, cupola	18.50 to 19.00
San Francisco, delivered	24.00
Seattle	18.00
St. Louis, railroad	19.50 to 20.00
St. Louis, agricultural	19.50 to 20.00
Valleys	19.50 to 19.75

HEAVY CAST

Boston (consumers)	17.00 to 17.50
Buffalo (breakable)	16.00 to 16.50
Cleveland	14.00 to 14.50
Detroit (automobile) (net ton)	15.50 to 16.00
Eastern Pennsylvania	18.00 to 18.50
New York (dealers)	14.00 to 14.50
Pittsburgh	18.00 to 18.50

MALLEABLE

Boston (railroad)	17.25 to 17.75
Buffalo	20.00 to 20.50
Chicago, railroad	20.25 to 20.75
Chicago, agricultural	18.25 to 18.75
Cincinnati, agricultural (dealers)	16.00 to 16.50
Cincinnati, railroad (dealers)	16.50 to 17.00
Cleveland, agricultural	18.50 to 18.75
Cleveland, railroad	19.50 to 19.75
Detroit (dealers)	16.00 to 16.50
Eastern Pennsylvania, railroad	16.50 to 17.00
Pittsburgh, railroad	20.50 to 21.00
St. Louis, agricultural	16.50 to 17.00
St. Louis, railroad	17.00 to 17.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham tram car	15.00 to 15.50
Boston (dealers)	14.50 to 15.00
Chicago	19.50 to 20.00
Cleveland	18.25 to 18.75
Detroit	14.50 to 15.00
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	15.50 to 16.00
Pittsburgh district	21.50 to 22.00
St. Louis	19.00 to 19.50

LOCOMOTIVE TIRES

Chicago	19.50 to 20.00
St. Louis	18.50 to 19.00

LOW PHOSPHORUS PUNCHINGS

Chicago	19.00 to 19.50
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	24.00 to 24.50